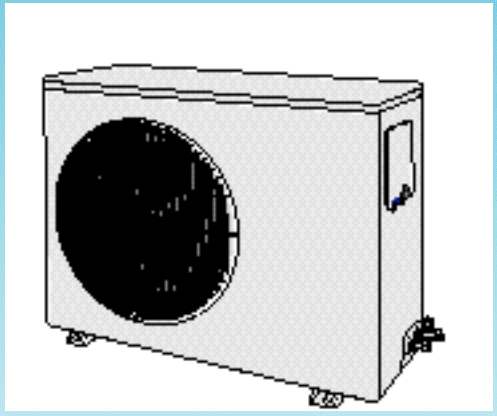
ROOM AIR CONDITIONER

INDOOR	INDOOR
AQT24A1QE/B	AQT24A2QE/B
AQT24B1QE/B	AQT24B2QE/B
AQ18A1QE/B	AQ18A2QE/B
AQ18B1QE/B	AQ18B2QE/B
SH24ZV	
SH18ZV	

SERVICE Manual

AIR CONDITIONER



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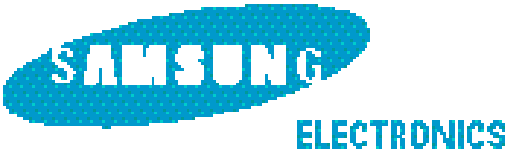

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Code No. DB81-00030A(1)

1. Precautions

1. Warning: Prior to repair, disconnect the power cord from the circuit breaker.

2. Use proper parts: Use only exact replacement parts. (Also, we recommend replacing parts rather than repairing them.)

3. Use the proper tools: Use the proper tools and test equipment, and know how to use them. Using defective tools or test equipment may cause problems later-intermittent contact, for example.

4. Power Cord: Prior to repair, check the power cord and replace it if necessary.

5. Avoid using an extension cord, and avoid tapping into a power cord. This practice may result in malfunction or fire.

6. After completing repairs and reassembly, check the insulation resistance. Procedure: Prior to applying power, measure the resistance between the power cord and the ground terminal. The resistance must be greater than 30 megohms.

7. Make sure that the grounds are adequate.

8. Make sure that the installation conditions are satisfactory. Relocate the unit if necessary.

9. Keep children away from the unit while it is being repaired.

10. Be sure to clean the unit and its surrounding area.

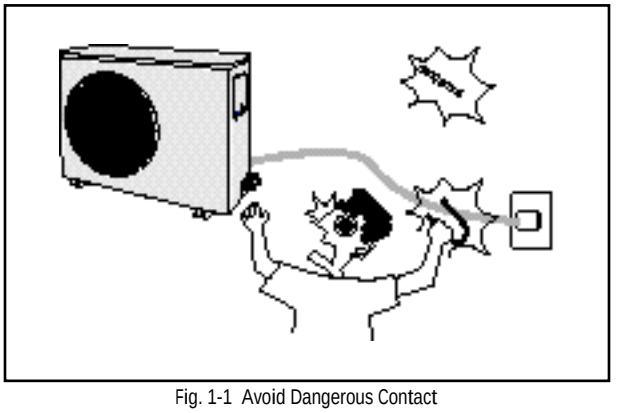

Fig. 1-1 Avoid Dangerous Contact

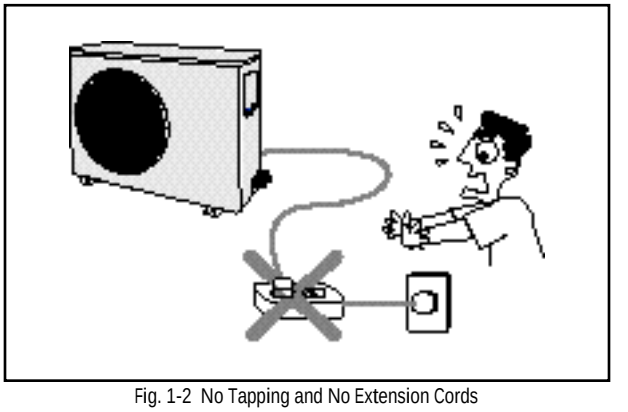

Fig. 1-2 No Tapping and No Extension Cords

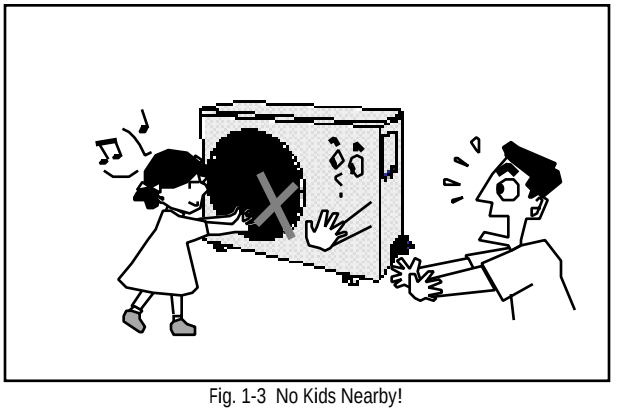

Fig. 1-3 No Kids Nearby!

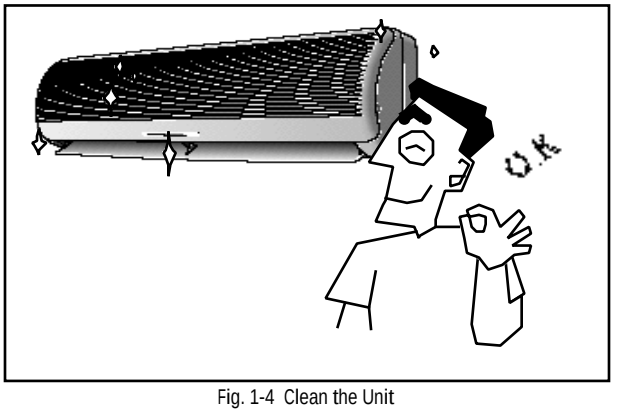

Fig. 1-4 Clean the Unit

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2. Product Specifications

2-1 Table

Item \ Model			AQT24A1(B1)QE / AQT24A2(B2)QE / SH24ZV				AQT24A1(B1)QB / AQT24A2(B2)QB				AQ18A1(B1)QE / AQ18A2(B2)QE / SH18ZV				AQ18A1(B1)QB / AQ18A2(B2)QB			
			Cool		Heat		Cool		Heat		Cool		Heat		Cool		Heat	
Power Sourse			220-240V~, 50Hz				220V~, 60Hz				220-240V~, 50Hz				220V~, 60Hz			
UNIT			BTU	KW	BTU	KW	BTU	KW	BTU	KW	BTU	KW	BTU	KW	BTU	KW	BTU	KW
Perfor-mance	Capacity		24,000BTU/h	6.80KW	24,000BTU/h	6.90KW	24,000BTU/h	-	24,000BTU/h	-	18,000BTU/h	5.10KW	20,000BTU/h	5.60KW	18,000BTU/h	-	20,000BTU/h	-
	Air circulation (High)	m^3/min	14.0	14.0	14.5	14.5	14.0	-	14.5	-	13.5	13.5	14.0	14.0	13.5	-	14.0	-
	Moisture removal (High)	Liters/h	3.0				3.0				2.5				2.5			
Electrical Rating	Available voltage range	V	198 ~ 264				187 ~ 253				198 ~ 264				187 ~ 253			
	Running amperes	A	12.5	12.5	13.0	13.0	13.0	-	13.5	-	8.3	8.3	8.5	8.5	8.5	-	9.0	-
	Power input	kw	2.6	2.6	2.7	2.65	2.6	-	2.7	-	1.85	1.80	1.95	1.85	1.85	-	1.95	-
	Power factor	%	86.7	86.7	86.5	84.9	90.9	-	90.9	-	92.9	90.4	95.6	90.7	98.9	-	98.5	-
	Energy efficiency ratio	BTU/wh	9.2	-	8.9	-	9.2	-	8.9	-	9.7	-	10.3	-	9.7	-	10.3	-
	Compressor locked rotor amperes	A	82				73				35				35			
Features	Controls/Temperature control		Microprocessor / I.C Thermostat				Microprocessor / I.C Thermostat				Microprocessor / I.C Thermostat				Microprocessor / I.C Thermostat			
	Control unit		Wireless remote control				Wireless remote control				Wireless remote control				Wireless remote control			
	Timer		Q-Timer / 24-Hour ON or OFF				Q-Timer / 24-Hour ON or OFF				Q-Timer / 24-Hour ON or OFF				Q-Timer / 24-Hour ON or OFF			
	Fan speed	Indoor/Outdoor	3 Steps and Turbo / 1 Step				3 Steps and Turbo / 1 Step				3 Steps and Turbo / 1 Step				3 Steps and Turbo / 1 Step			
	Airflow direction (indoor)	Horizontal	Manual				Manual				Manual				Manual			
		Vertical	Auto				Auto				Auto				Auto			
	Comperssor		Reciprocating(Tecumseh)				Reciprocating(Tecumseh)				Rotary(SAMSUNG)				Rotary(SAMSUNG)			
	Refrigerant/Amount charged at rating	g	R22 / 1,600g				R22 / 1,600g				R22 / 1,550g				R22 / 1,550g			
	Refrigerant control		Capillary tube				Capillary tube				Capillary tube				Capillary tube			
	(Sound pressure)	Indoor Hi/Me/Lc dB-A	45 / 43 / 41				45 / 43 / 41				45 / 42 / 39				45 / 42 / 39			
		Outdoor-Hi dB-A	58				58				55				55			
	Refrigerant tubing connections		Flare type				Flare type				Flare type				Flare type			
	Max. allowable tubing length at shippint	m	10				10				10				10			
	Refrigerant tube diameter	Narrow tube (in.)	6.35(1/4")				6.35(1/4")				6.35(1/4")				6.35(1/4")			
		Wide tube (in.)	15.88(5/8")				15.88(5/8")				12.70(1/2")				12.70(1/2")			
	Refrigerant tube kit/Accessories		Optional / Hanger-plate				Optional / Hanger-plate				Optional / Hanger-plate				Optional / Hanger-plate			
Dimensions & Weight			Indoor unit		Outdoor		Indoor unit		Outdoor		Indoor unit		Outdoor		Indoor unit		Outdoor	
	Unit dimensions	Height mm	275		638		275		638		275		620		275		620	
		Width mm	1080		880		1080		880		1080		787		1080		787	
		Depth mm	204		310		204		310		204		320		204		320	
	Package dimensions	Height mm	372		851		372		851		372		680		372		680	
		Width mm	1153		1023		1153		1023		1153		926		1153		926	
		Depth mm	272		413		272		413		272		451		272		451	
	Weight	Net kg	13		63.0		13		63.0		13		46.0		13		46.0	
		Shipping kg	16		67.0		16		67.0		16		50.0		16		50.0	

Remarks : Rating Conditions are :

Indoor air temperature ISO(50Hz) : 27˚C DB/19.0˚C WB, ISO(60Hz) : 27.0˚C DB/19.5˚C WB

Outdoor air temperature ISO : 35.0˚C DB/24.0˚C WB

2-2 Major Component specifications

■ Indoor unit

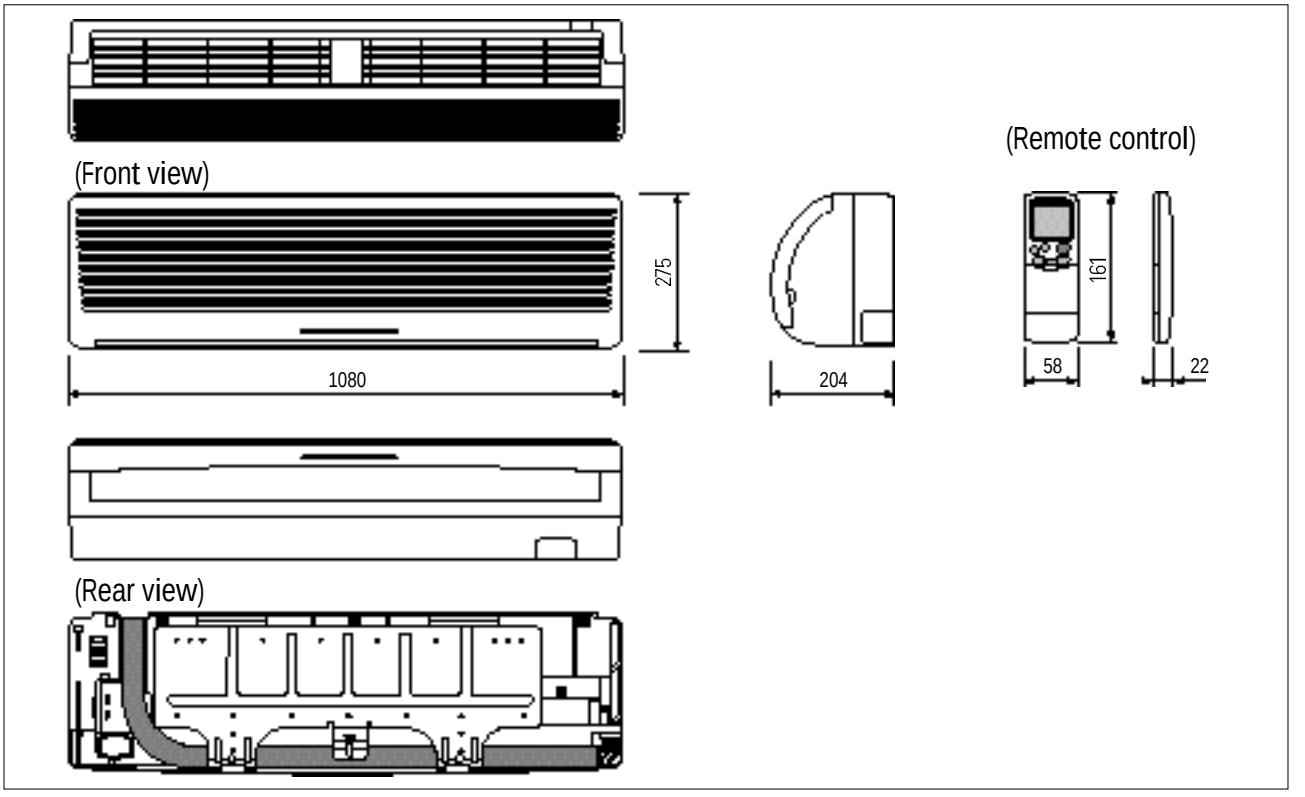
Model				AQT24A1(B1)QE / AQT24A2(B2)QE / SH24ZV	AQT24A1(B1)QB / AQT24A2(B2)QB	AQ18A1(B1)QE / AQ18A2(B2)QE / SH18ZV	AQ18A1(B1)QB / AQ18A2(B2)QB
PCB	Part No.			PD-Q24B1Q-03	PD-Q24B1Q-03	PD-Q24B1Q-09	PD-Q24B1Q-09
	Controls			Microprocessor	Microprocessor	Microprocessor	Microprocessor
	Control circuit fuse			250V, 3.15A	250V, 3.15A	250V, 3.15A	250V, 3.15A
Fan & Fan Motor	Type			Cross-Flow	Cross-Flow	Cross-Flow	Cross-Flow
	Dia. and length		mm	ø95/L = 842	ø95/L = 842	ø95/L = 842	ø95/L = 842
	Fan motor model			IC-9430SKJ5A	IC-9430SKF6A	IC-9430SKJ5A	IC-9430SKF6A
	Pols,rpm(at 240V)			4P, 1350 RPM	4P, 1350 RPM	4P, 1350 RPM	4P, 1350 RPM
	Normal out		W	40W	40W	40W	40W
	Coil resistance(Ambient temp.20˚C)		Ω	MAIN : 160Ω	MAIN : 140Ω	MAIN : 160Ω	MAIN : 140Ω
				SUB : 227Ω	SUB : 280Ω	SUB : 227Ω	SUB : 280Ω
	Safety devices	Type		17AM034A5	17AM034A5	17AM034A5	17AM034A5
		Operating temp.	Open ˚C	135 ± 5°C	135 ± 5°C	135 ± 5°C	135 ± 5°C
	Run capacitor		µF x VAC	1.2µF X 450VAC	1.2µF X 450VAC	1.2µF X 450VAC	1.2µF X 450VAC
S-Motor	Type						
	Model			MSFCC20A03	MSFCC20A03	MSFCC20A03	MSFCC20A03
	Rating			DC 12V	DC 12V	DC 12V	DC 12V
	Coil resistance (Ambient temp. 25˚C)		Ω	530Ω	530Ω	530Ω	530Ω
Heat Exch.	Coil			AL-FIN/Copper tube	AL-FIN/Copper tube	AL-FIN/Copper tube	AL-FIN/Copper tube
	Rows x Steps			2 x 15	2 x 15	2 x 15	2 x 15
	Fin pitch		mm	1.2	1.2	1.5	1.5
	Face area		m^2	0.315	0.315	0.315	0.315

■ Outdoor unit

Model				UQT24A1(B1)QE / UQT24A2(B2)QE / XSH24ZV	UQT24A1(B1)QB / UQT24A2(B2)QB	UQ18A1(B1)QE / UQ18A2(B2)QE / XSH18ZV	UQ18A1(B1)QB / UQ18A2(B2)QB
Compressor	Type			Reciprocating	Reciprocating	Rotary	Rotary
	Compressor model			AWG5532EXC	AWG5528EXN	48B180JV1E7	48B190IV2E7
	Normal output		W	2660	2830	1885	1885
	Comperssor oil kind			WITCO LP200 OR EQUIVALENT	WITCO LP200 OR EQUIVALENT	SUNSO-4GSD-T	SUN1SO-4GSD-T
	Comperssor oil		cc	INITIAL : 1125 REFILL : 1066	INITIAL : 1125 REFILL : 1066	600	600
	Oil Specific gravity			0.92	0.92	0.92	0.92
	Coil resistance(Ambient temp.25˚C)		Ω	Start winding : 2.49	Start winding : 1.94	Common to main : 1.84	Common to main : -
				Run winding : 0.81	Run winding : 0.88	Common to sub : -	Common to sub : -
	Safety devices	Type		15HM2415-148	15HM2415-148	MRA12016-12007	MRA12016-12007
		Overloal relay		Internal Line Break	Internal Line Break	External Line Break	External Line Break
		Operating temp.	Open ˚C	120	120	165°C	165°C
			Close ˚C	69	69	74°C	74°C
		Operating amp(Ambient temp.)		73.0 AT 2-10 SECOND	73.0 AT 2-10 SECOND	120·°C : 10.7A 130°C : 9.4A	120·°C : 10.7A 130°C : 9.4A
	Run capacitor		µF x VAC	45MF X 370VAC	35MF X 370VAC	40µF X 450VAC	40µF X 450VAC
Fan & Fan Motor	Type			Propeller	Propeller	Propeller	Propeller
	Dia. and length		mm	ø460	ø460	ø405	ø405
	Fan motor model			OSME-716SRC	OSME-716SRC	AMASS-035AVEB	AMASS-035ZTEA
	Pols, rpm(at240V)			6P, 850 RPM	6P, 850 RPM	4P, 1050 RPM	4P, 1050 RPM
	Normal output		W	70W	70W	35W	35W
	Coil resistance(Ambient temp.20˚C)		Ω	MAIN : 58Ω - 88Ω	MAIN : 58Ω - 88Ω	MAIN : 186Ω	MAIN : 127Ω
				SUB : 85Ω - 150Ω	SUB : 85Ω - 150Ω	SUB : 210Ω	SUB : 165Ω
	Safety devices	Type		17AM034A5	17AM034A5	17AM037A5	17AM037A5
		Operating temp.	Open ˚C	135±5°C	135±5°C	150±5°C	150±5°C
			Close ˚C				
	Run capacitor		µF x VAC	3µF x 450VAC	3µF x 450VAC	2.5µF x 450VAC	2.5µF x 450VAC
Heat Exch.	Coil			AL-FIN / Copper tube	AL-FIN / Copper tube	AL-FIN / Copper tube	AL-FIN / Copper tube
	Rows x Steps			2 x 24	2 x 24	2 x 24	2 x 24
	Fin pitch		mm	1.7	1.7	1.7	1.7
	Face area		m^2	0.5376	0.5376	0.504	0.504

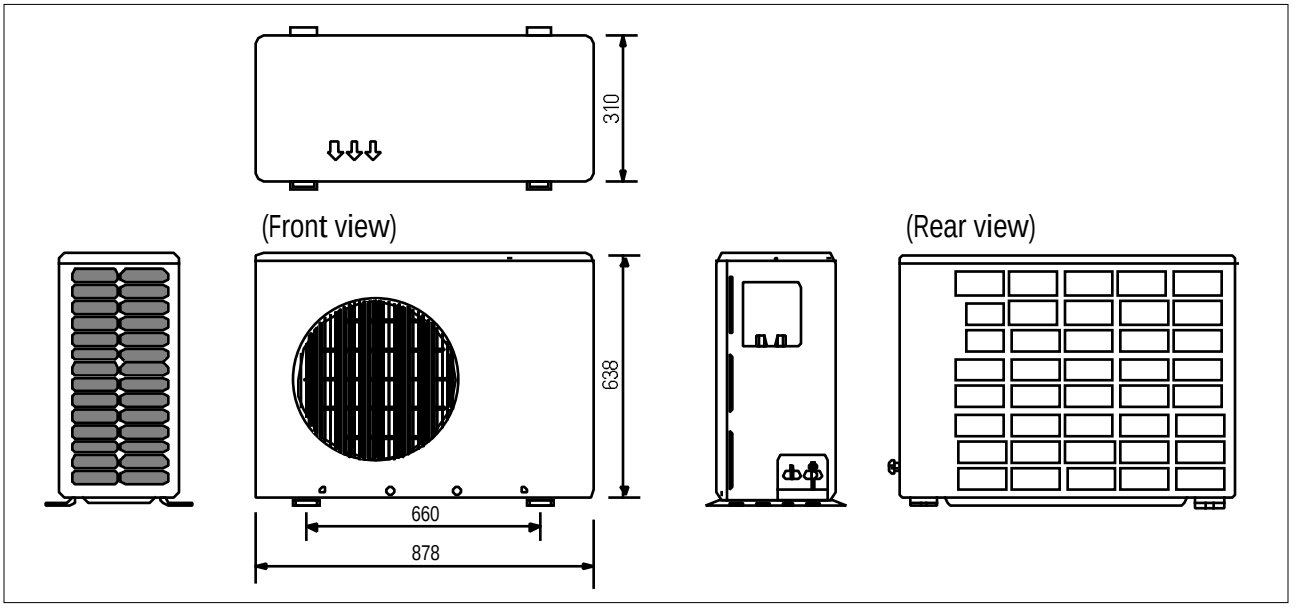
2-3 Dimensions

2-3-1 Indoor Unit

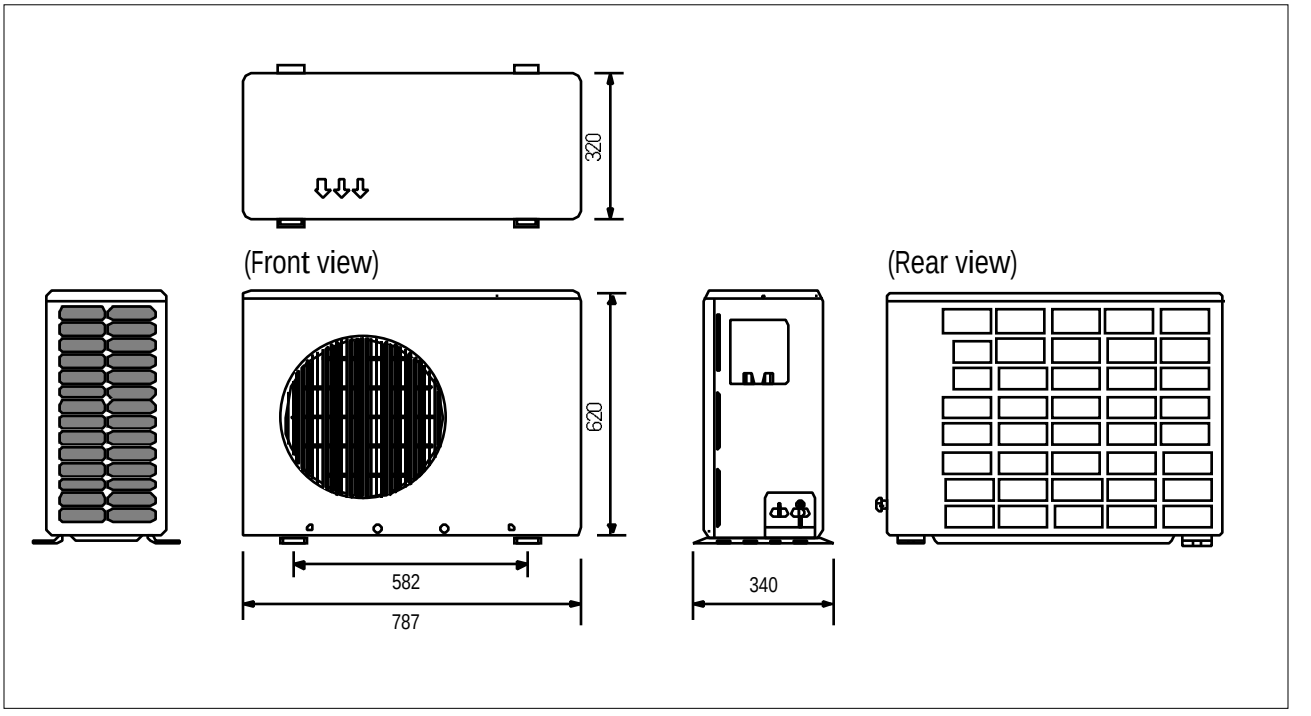


2-3-2 Outdoor Unit

2-3-2(a) 24K BTU

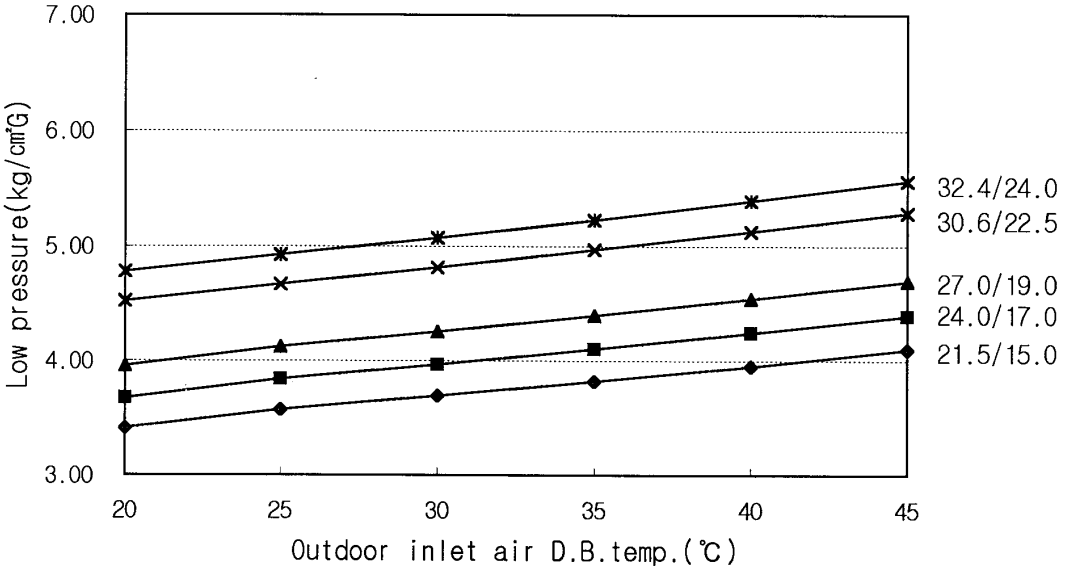


2-3-3(b) 18K BTU

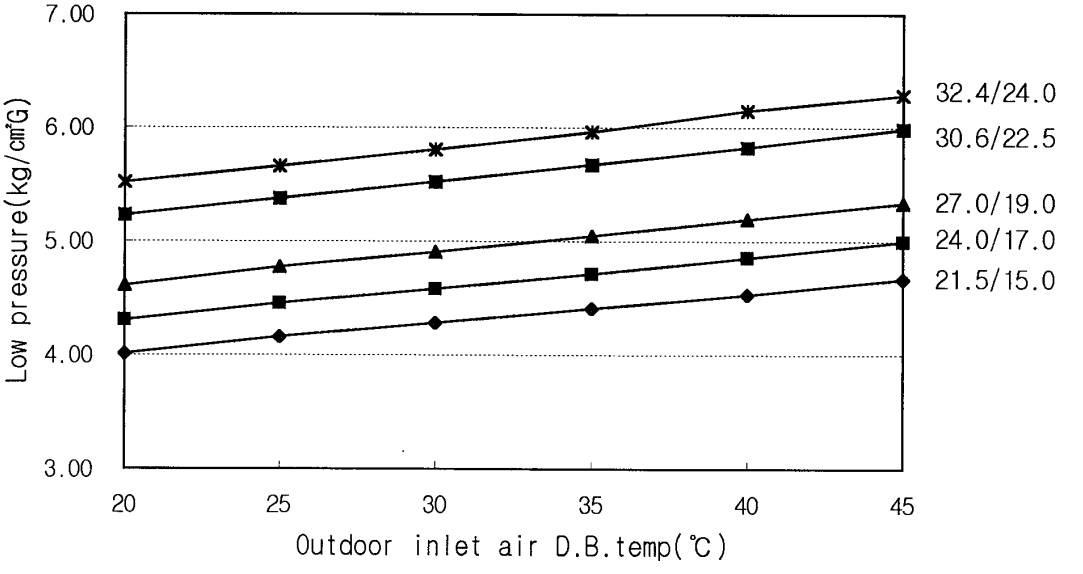


2-4 Pressure Graph

■ 24K BTU



■ 18K BTU



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3. Operating Instructions and Installation

3-1 Operating Instructions

3-1-1 Name & Function of Key in remote controller

NO		NAMED OF KEY		FUNCTION OF KEY
1				On/Off Button. Use this button to start and stop air conditioner.
2			▲ (UP)	Temp. up button. If the ▲ button is pressed once, the setting temperature is increased by 1°C
			▼ (DOWN)	Temp. down button. If the ▼ button is pressed once, the setting temperature is decreased by 1°C
3		MODE		Each time you press this button, MODE is changed in the following order. : Auto Mode : Fan Only Mode : Cool Mode : Heat Mode : Dry Mode
4		TURBO		Use this button to provide heavy duty cooling & Heating for 30 minutes.
5		OFF		Set up the reserve or cancel the timer on and timer off quickly
6				Use this button for sleep operation. (The SLEEP mode can be selected at COOL and HEAT mode.)
7				Adjusts air flow vertically.
8				Each time you press this button, FAN SPEED is changed in the following order.
9	COVER	TIMER	ON TIMER	Set up the time that operation start.
10			OFF TIMER	Set up the time that operation stop.
11			SET	Use this button to reserve the timer on.
12			CANCEL	Use this button to reserve or cancel the timer on and timer off.
13			(UP)	If the button is pressed once, the time increase by one minute during the time set mode, and ten minutes during the timer set mode.
14			(DOWN)	If the button is pressed once, the time decrease by one minute during the time set mode, and ten minutes during the timer set mode.
15			TIME	Without regard to ON/OFF condition in remote controller, use this button to set current time. Adjust the current time using button. (Data can be transmitted after setting up the time)

3-1-1 Name & Function of Key in remote controller

1. AUTO MODE : In this mode, operation mode(COOL, HEAT) is selected automatically by the room temperature of initial operation.

Room Temp	Operation Type
Tr≥ 21°C+ΔT	Cool Operation (Set Temp:24°C+ΔT)
21°C +ΔT>Tr	Heat Operation (Set Temp : 22°C+ΔT)

   ΔT= -2°, -1°C, 0°C+1°C+2°C
   ΔT is controlled by setting temperature up(▲)/down(▼) key of remote controller

2. COOL MODE : The unit operates according to the difference between the setting and room temperature. (18°C~30°C)

3. HEAT MODE : The unit operates according to the difference between the setting and room temperature.(16°C~30°C)
   *Prevention against cold wind : For about 3~5 minutes after initial operation, thermo control or "de-ice", the indoor fan will either not operate or operate very slowly, then switch to the selected fan speed. This period is to allow the indoor unit's heat-exchanger to prewarm before emitting warm air.
   *High temperature release function : The outdoor unit for and compressor ON/OFF control for safety operation, when the overheat is heat exchanger of indoor unit.
   *De-ice : Deicing operation is controlled by indoor unit's heat exchanger temperature and accumulating time of compressor's operation.
   De-ice end by sensing of the processing time by de-ice Condition.

4. DRY MODE :
   The unit operates in DRY mode.
   *Compressor ON/OFF Time is controlled compulsorily(can not set up the fan speed, always breeze).
   *Protective function : Low temperature release. (Prevention against freeze)

5. TURBO MODE : This mode is available in AUTO, COOL, HEAT, DRY, FAN MODE.
   When this button is pressed at first, the air conditioner is operated "powerful" state for 30 minutes regardless of the set temperature, room temperature.
   When this button is pressed again, or when the operating time is 30 minutes, turbo operation mode is canceled and returned to the previous mode.
   *But, if you press the TURBO button in DRY or FAN mode that is changed with AUTO mode automatically.

6. SLEEP MODE : Sleep mode is available only in COOL or HEAT mode.
   The operation will stop after 6 hours.
   *In COOL mode : The setting temperature is automatically raised by 1°C each 1hour When the temperature has been raised by total of 2°C, that temperature is maintained.
   *In HEAT mode : The setting temperature is automatically droped by 1°C each 1hour. When the temperature has been droped by total of 2°C, that temperature is maintained.

7. FAN SPEED : Manual / Auto
   Fan speed automatically varies depending on both the difference between setting and the room temperature.

8. COMPULSORY OPERATION :
   For operating the air conditioner without the remote controller.
   [*AUTO] : The operating is the same function that AUTO MODE in the remote controller.

9. SWING : BLADE-H is rotated vertically by the stepping motor.
   [*Swing Set / Auto] : Press the utton under the remote control is displayed on LCD the and the blades move up and down. about 3°. If the one more time press the utton, blatles location is stop.

10. Quick OFF TIMER: OFF timer (quick timer) allows reservation or cancel the timer on and timer off quickly
    When OFF timer button is pressed at operating state, LCD displays the polling state sequentially.
    The LCD also displays the time remaining.

11. 24-Hour ON / OFF Real Setting Timer. : The air conditioner is turned ON at a specified time using [ON TIMER].
    OFF TIMER : The air Conditioner is turned OFF at a specified time using [OFF TIMER].
    *ON TIMER : Only timer LED lights on.
    *OFF TIMER : Both timer and operation LED lights on.

12. SELF Diagnosis

LED DISPLAY				Check Point
operation	TIMER	FAN	Turbo	
◑	○	○	○	Interruption of electric power and Power on.
○	◑	○	○	Abnormal condition of the room sensor.
◑	◑	○	○	Abnormal condition of the indoor unit's heat exchanger sensor.
○	○	◑	○	Indoor unit fan motor lock.

◑ : LED blinking ○ : LED off

13. BUZZER SOUND : Whenever the ON / OFF button is pressed or whenever change occurs to the condition which is set up or select, the compulsory operation mode, buzzer is sounded "beep"

3-2 Installation

3-2-1 Selecting Area for Installation

Select an area for installation that is suitable to the customer's needs.

3-2-1(a) Indoor Unit

1. Make sure that you install the indoor unit in an area providing good ventilation. It must not be blocked by an obstacle affecting the airflow near the air inlet and the air outlet.
2. Make sure that you install the indoor unit in an area allowing good air handling and endurance of vibration of the indoor unit.
3. Make sure that you install the indoor unit in an area where there is no source of heat or vapor nearby.
4. Make sure that you install the indoor unit in an area from which hot or cool air is spread evenly in a room.
5. Make sure that you install the indoor unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).
6. Make sure that you install the indoor unit in an area which provides easy pipe connection with the outdoor unit, and easy drainage for condensed water.
7. Make sure that you install the indoor unit in an area which is large enough to accomodate the measurements shown in figure on the next page.

3-2-1(b) Outdoor Unit

1. Make sure that you install the outdoor unit in area not exposed to the rain or direct sun light.
   (Install a separate sunblind if exposed to direct sun light.)
2. Make sure that you install the outdoor unit in area allowing good air moment, not amplifying noise or vibration, especially to avoid disturbing neighbours.
   (Fix the unit firmly if it is mounted in a high place.)
3. Make sure that you install the outdoor unit in area providing good ventilation and which is not dusty. It must not be blocked by any obstacle affecting the airflow near the air inlet and the air outlet.
4. Make sure that you install the outdoor unit in area free from animals or plants.
5. Make sure that you install the outdoor unit in area not blocking the traffic.
6. Make sure that you install the outdoor unit in area easy to drain condensed water from the indoor unit.
7. Make sure that you install the outdoor unit in area which provides easy connection within the maximum allowable length of a coolant pipe(10 meters).

   Note
   1. Add (18XX:20g, 24XX:30g) of refrigerant (R-22) for every 1 meter if the pipe length exceeds the standard pipe length of 5 meters.
   2. Maintain a height between the indoor and outdoor units of less than 3 meters.
8. Make sure that you install the outdoor unit in an area which is large enough to accommodate the measurements shown in figure on the next page.

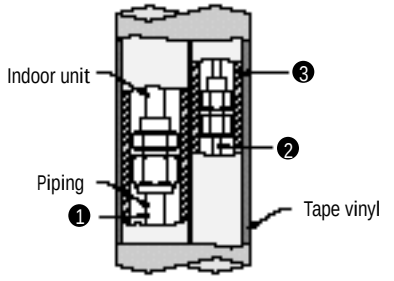
3-2-1(c) Remote Control Unit

1. Make sure that you install the remote control unit in an area free from obstacles such as curtains etc, which may block signals from the remote control unit.
2. Make sure that you install the remote control unit in an area not exposed to direct sunlight, and where there is no source of heat.
3. Make sure that you install the remote control unit in an area away from TVs, audio units, cordless phones, fluorescent lighting fixtures and other electrical appliances (at least 1 meter).

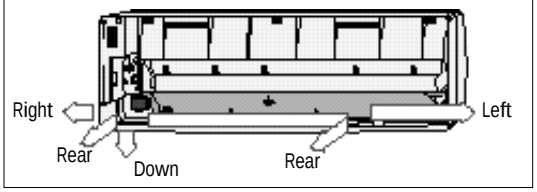
Caution :
It is harmful to the air conditioner if it is used in the following environments: greasy areas (including areas near machines), salty areas such as coast areas, areas where sulfuric gas is present such as hot spring areas. Contact your dealer for advice.

3-2-2 Installation diagram of indoor unit and outdoor unit

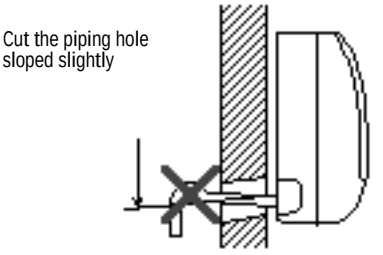
A Indoor unit gas leak test check point

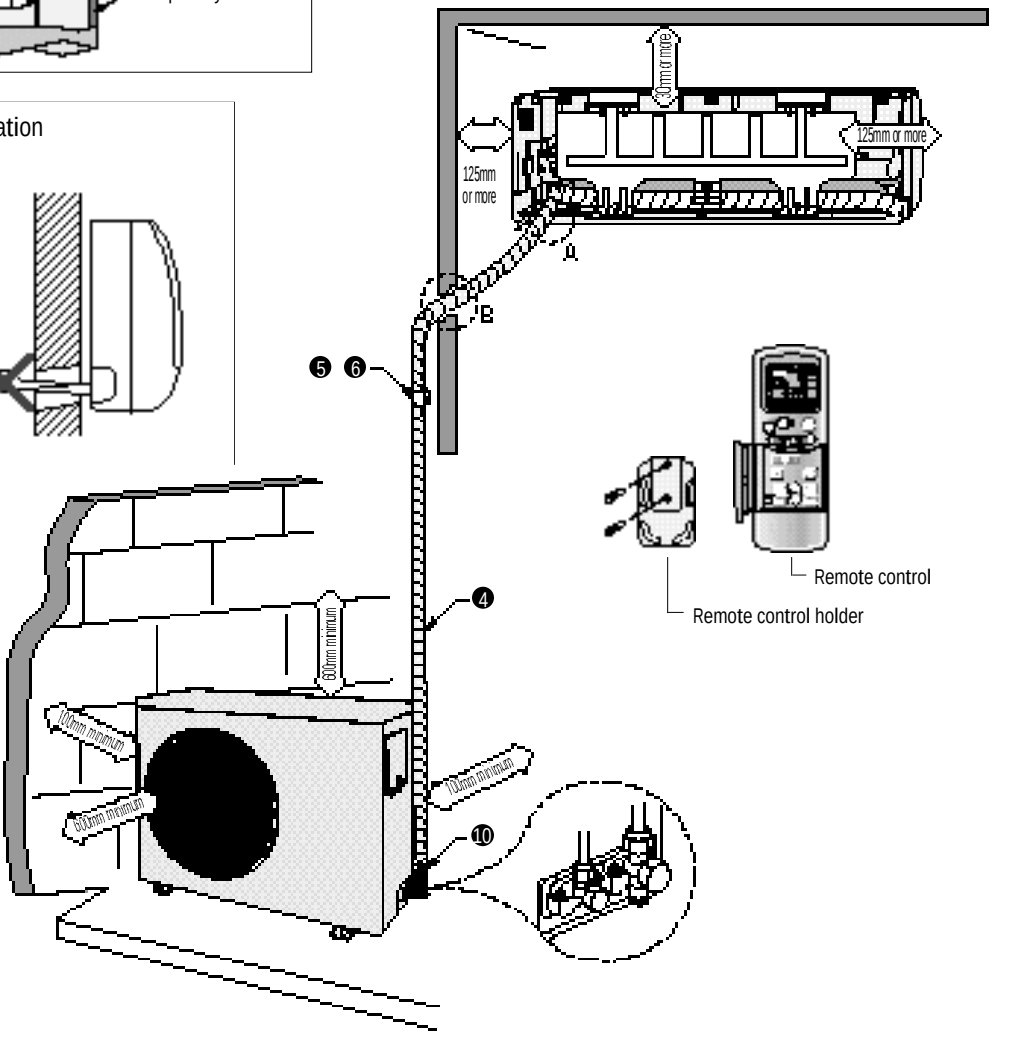


Piping may be laid to the rear, left, right or down .



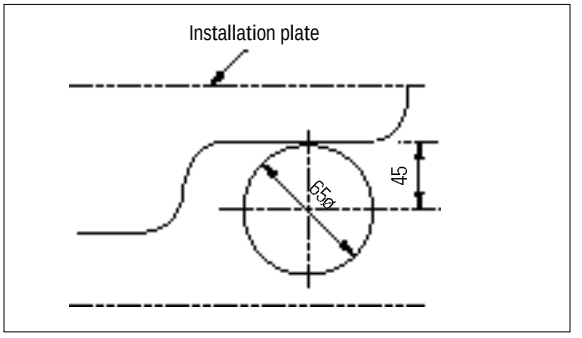
B Drain hose installation





❶	Piping (Liquid) 1/4"		❻	Clamper tube
❷	18K BTU 24K BTU	Piping(Gas) 1/2" Piping(Gas) 5/8"	❼	Installation plate
❸	Installation tube		❽	Pipe-connection
❹	Vinyl tape		❾	Screw
❺	Putty		❿	Drain hose

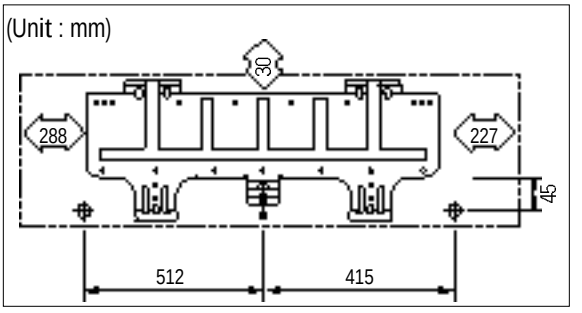
3-2-2(a) Fixing the Installation Plate



1. Determine the position of the pipe and drain hose hole using the right figure and drill the hole with an inner diameter of 65mm so that it slants slightly downwards.

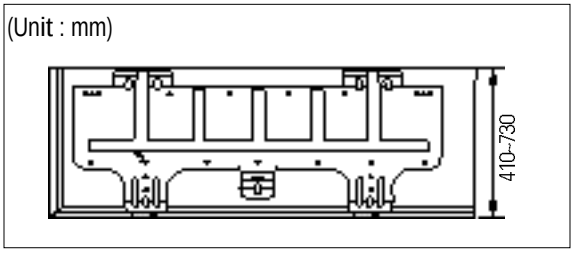
2. **If you are fixing the indoor unit to a… Then follow Steps…**

Wall	**3.**
Window frame	**4 to 6.**



3. Fix the installation plate to the wall in a manner appropriate to the weight of the indoor unit.

   If you are mounting the plate on a concrete wall with anchor bolts, the anchor bolts must not project by more than 20mm.

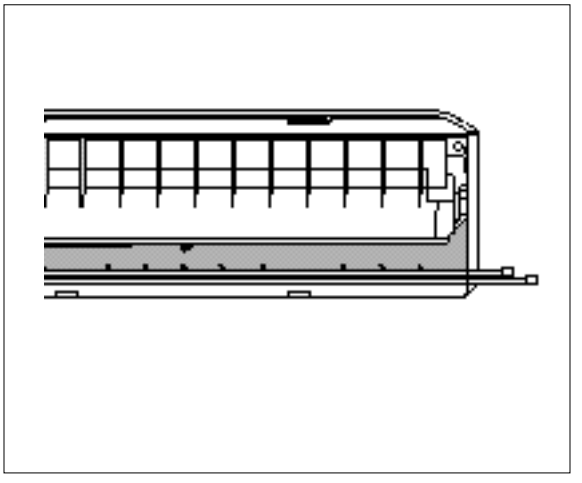


4. Determine the positions of the wooden uprights to be attached to the window frame.

5. Attach the wooden uprights to the window frame in a manner appropriate to the weight of the indoor unit.

6. Using tapped screws, attach the installation plate to the wooden uprights, as illustrated in the last figure opposite.

3-2-2(b) Purging the Unit



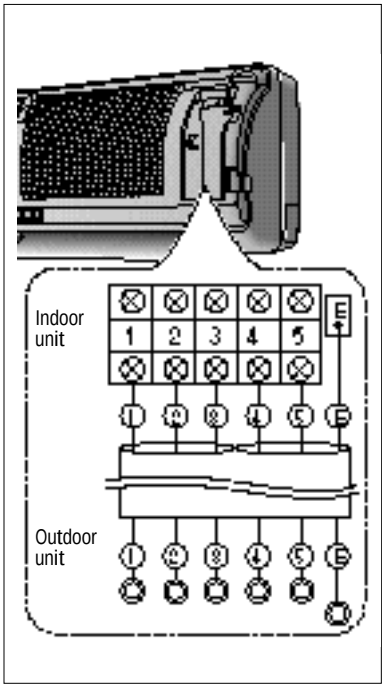
On delivery, the indoor unit is loaded with an inert gas. All this gas must therefore be purged before connecting the assembly piping. To purge the inert gas, proceed as fol - lows.

Unscrew the caps at the end of each pipe.

Result : All inert gas escapes from the indoor unit.

- **To prevent dirt or foreign objects from getting into the pipes during installation, do NOT remove the caps completely until you are ready to connect the piping.**

3-2-2(c) Connecting the Assembly Cable.

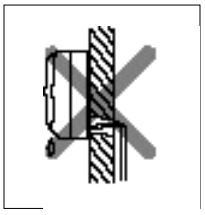


The indoor unit is powered from the outdoor unit via the assembly cable. If the outdoor unit is more than five metres away from the indoor unit, the cable must first be extended to a maximum of 15 metres.

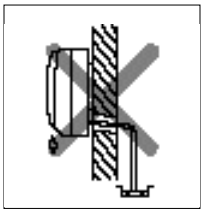
1. Extend the assembly cable if necessary.
2. Open the front grille by pulling on the tabs on the lower right and left sides of the indoor unit.
3. Remove the screw securing the connector cover.
4. Pass the assembly cable through the rear of the indoor unit and connect the assembly cable to terminals 1 to 5.
   - Each wire is labelled with the corresponding terminal number.
5. Firmly fix the ass'y cable with clamp wire holder.
6. Pass the other end of the cable through the 65mm hole in the wall.
7. Replace the connector cover, carefully tightening the screw.
8. Close the front grille.
9. For further details on how to plug the other end of the assembly cable into the outdoor unit, refer to page 3-8.

3-2-2(d) Installing and Connecting the Indoor Unit Drain Hose

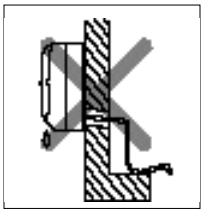
Care must be taken when installing the drain hose for the indoor unit to ensure that any condensa - tion water is correctly drained outside.l When passing the drain hose through the 65mm hole drilled in the wall, check that none of the following situations occur.



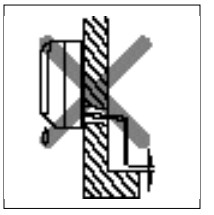
The hose must NOT slope upw ards.



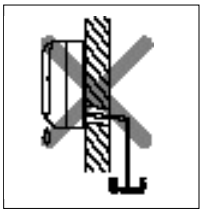
The end of the drain hose must NOT be placed in water.



Do NOT bend the hose in different directions.



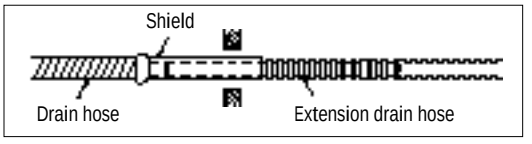
Keep a clearance of at least 5cm between the end of the hose and the ground.



Do NOT place the end of the drain hose in a hollow.

To install the drain hose, proceed as follows.

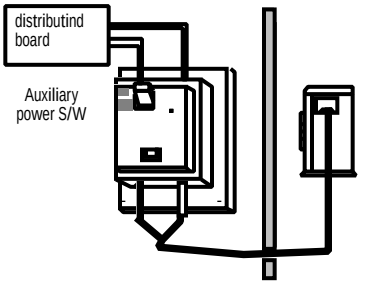
1. If necessary, connect the 2-metre extension to the drain hose.
2. If you are using the extension, insulate the inside part of the extension drain hose with a shield.
3. Pass the drain hose under the refrigerant piping, taking care to keep the drain hose tight.
4. Pass the drain hose through the hole in the wall, making sure that it is sloping downwards, as shown in the illustrations above.



3-2-2(e) Outdoor unit installation

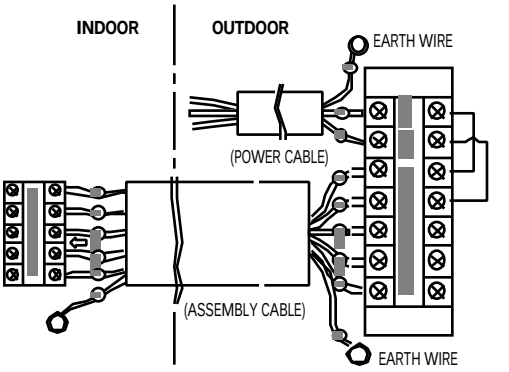
AUXILIARY POWER S/W

Auxiliary power S/W should be installed near indoor unit so that each access is possible.Main/Outdoor unit power cords are connected to upper/lower terminal of auxiliary power S/W.



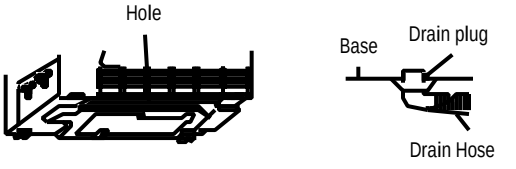
WIRING CONNECTION

Indoor unit connector wire should be connected to both indoor unit connector and outdoor unit terminal board as shown in the figure below.



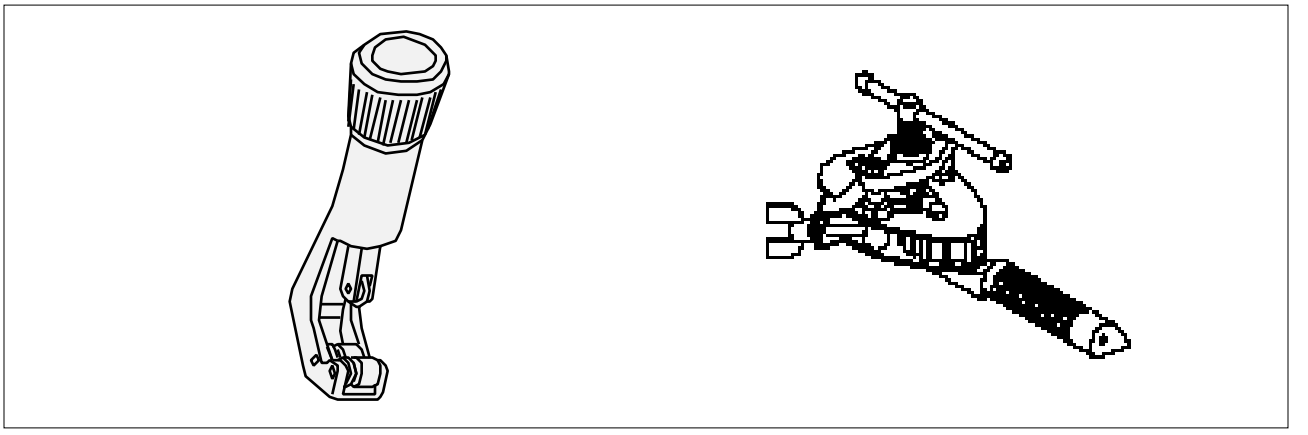
INSTALLATION OF DRAIN LINE

In heating and deice operation, condensed water may be generated. Install drain line as following procedure.
1. Insert the drain plug into base hole
2. And then connect drain hose to drain plug.



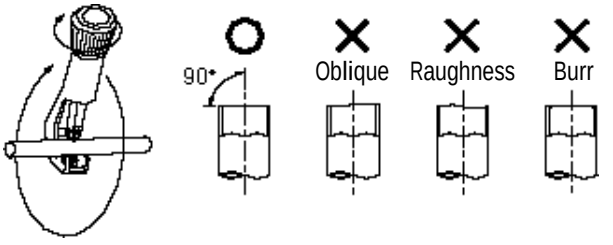
3-2-2(f) Flare Modification

• Tools used



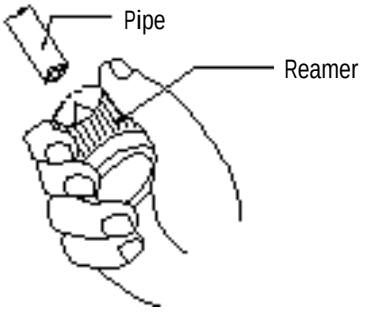
Flare modification procedure

1) Cut the pipe using a pipe cutter.

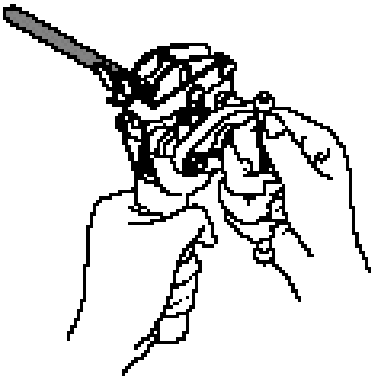


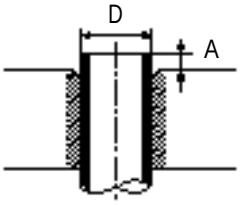
2) Remove burrs at the tip of the pipe cut.

Caution : Burrs not removed may result in leakage of gas.



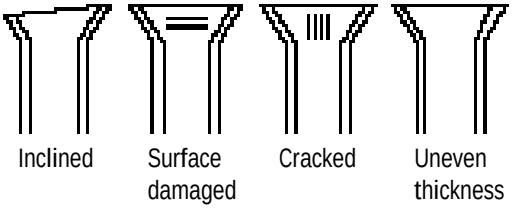
3) Insert a flare nut into the pipe and modifty flare.





Outer diameter	A(mm)
ø6.35mm	1.3
ø9.52mm	1.8
ø12.7mm	2.0
ø15.8mm	2.2

* Unproper flaring



3-2-2(g) Air-Purge Procedure

• Use the refrigerant of the outdoor unit to purge air inside indoor unit and pipe.

1. Remove the caps from the 2-way valve(B) and the 3-way valve(A).

↓

2 Turn the 2-way valve cock approx. 45° counterclockwise to open it. Close it about 10 seconds later.

↓

3 Check refrigerant leakage of each joint parts (A, B, C & D in right figure)

↓

not leaking

Leaking

If leaking, tighten the flare nut one more time. If continues to leak, although the pipe fixing area has been tightened again, repair the leaking area.

4. Open the 2-way valve again.

↓

5. Open the service valve cap of the 3-way valve and press the needle valve to discharge gas for 3 seconds and leave it for about 1 minute.
Repeat the above procedure for 3 times to purge air.

↓

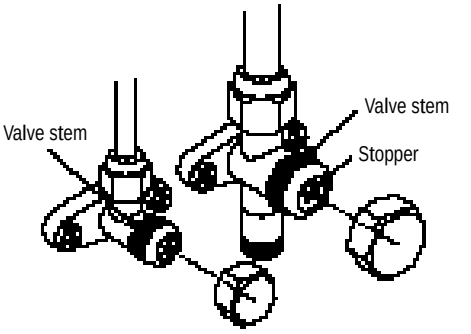
6. Open the 2-way valve and 3-way valve completely

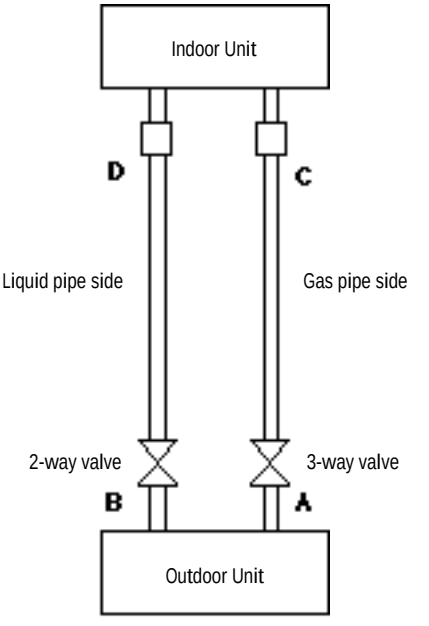
↓

7. Close the cap of each valve.

↓

8. Check each valve for leakage.





3-2-2(h) Refrigerant Refill

• Refill an air-conditioner with refrigerant when refrigerant has been leaked at installing or using

1. Purge air(for new installation only).

↓

2. Turn the 3-way valve clockwise to close, connect the pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.

↓

3. Connect the tank to refill with Refrigerant

↓

4. Set the unit to cool operation mode.

↓

5. Check the pressure indicated by the pressure gauge(low pressure side).
   * Standard pressure is should be 4.5~5.5kg/cm^2 in a regular, high operation mode.

↓

6. Open the refrigerant tank and fill with refrigerant until the rated pressure is reached.
   * It is recommended not to pour the refrigerant in too quickly, but gradually while operating a pressure valve.

↓

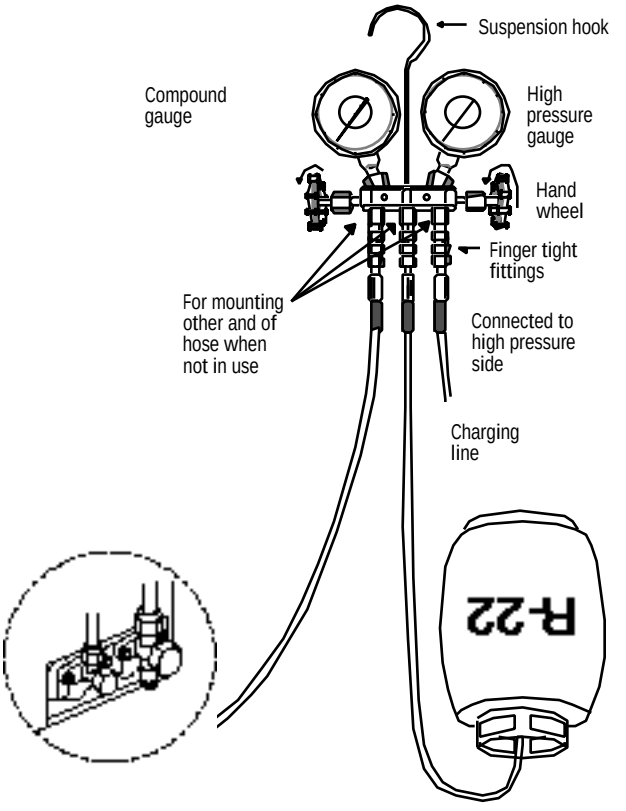
7. Stop operation of the air conditioner.

↓

8. Close the 3-way valve, disconnect the pressure gauge, and open the 3-way valve again.

↓

9. Close the cap of each valve.



3-2-2(i) Refrigerant Adjustment

Class	At installation		At service	
Connection Pipe Length	Air-Purge Method	Refrigerant Adjustment	Air-Purge Method	Refrigerant Quantity
5m Max.	Refer to the detailed Air-Purge Procedure	Unnecessary	Purge air using a vaccum pump or an additional refrigerant cylinder.	refer to specification sheet
5~10m		Add "A" of refrigerant (R-22) for every 1m.		Add "A" of refrigerant (R-22) for every 1m.

MODEL	"A"
24K BTU	30g
18K BTU	20g

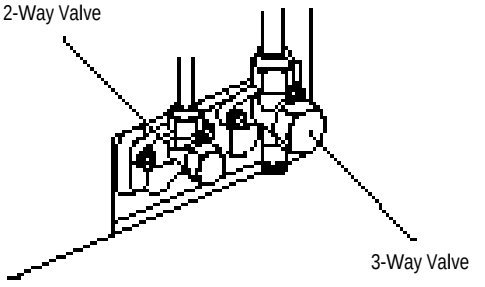
3-2-2(j) Flare unt fixing torque

Outter diameter	Torque (kg-cm)	
	Fixing Torque	Final Torque
ø 6.35 mm (Liquid Side)	160	200
ø 9.52 mm (Gas Side)	300	350
ø 12.7 mm (Gas Side)	500	550
ø 15.8 mm (Gas Side)	700	750

3-2-2(k) "Pump down" Procedure

- Pump down' shall be carried out when an evaporator is replaced or when the unit is relocated in another area.

1. Remove the caps from the 2-way valve and the 3-way valve.
↓
2 Turn the 3-way valve clockwise to close and connect a pressure gauge(low pressure side) to the service valve, and open the 3-way valve again.
↓
3. Set the unit to cool operation mode. (Check if the compressor is operating.)
↓
4. Turn the 2-way valve clockwise to close.
↓
5 When the pressure gauge indicates "0" turn the 3-way valve clockwise to close.
↓
6. Stop operation of the air conditioner.
↓
7. Close the cap of each valve.



Relocation of the air conditioner

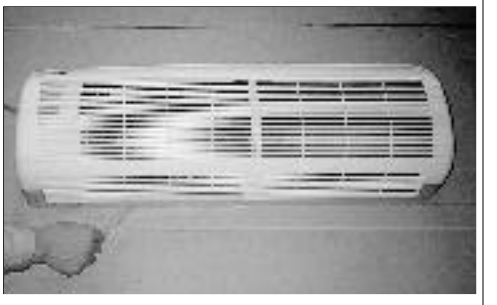
- Refer to this procedure when the unit is relocated.

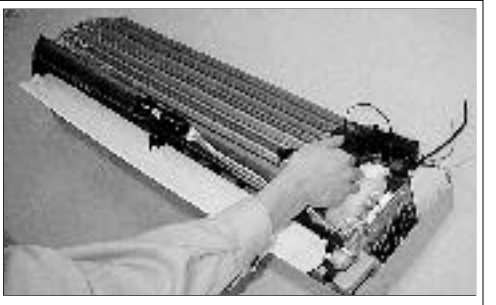
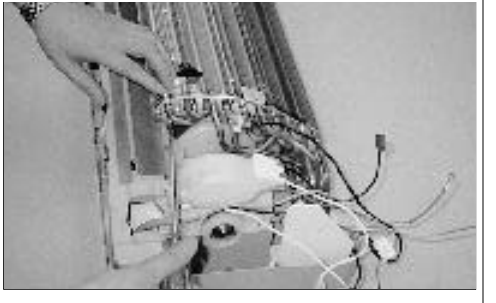
1. Carry out the pump down procedure (refer to the details of 'pump down').
2. Remove the power cord.
3. Disconnect the assembly cable from the indoor and outdoor units.
4. Remove the flare nut connecting the indoor unit and the pipe.
   At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
5. Disconnect the pipe connected to the outdoor unit.
   At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
6. Make sure you do not bend the connection pipes in the middle and store together with the cables.
7. Move the indoor and outdoor units to a new locatioon.
8. Remove the mounting plate for the indoor unit and move it to a new location.

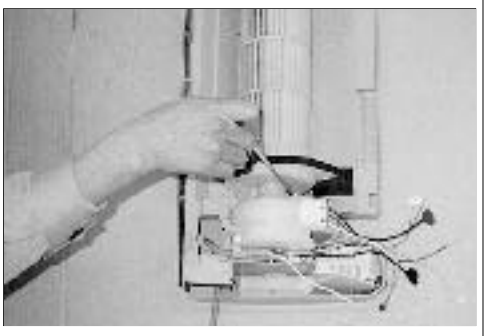
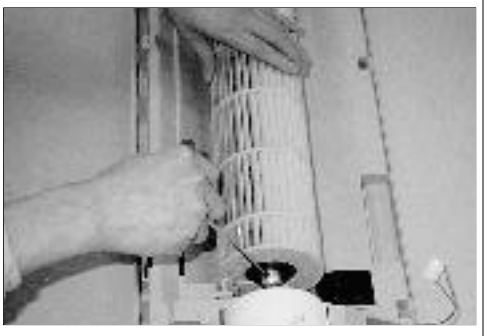
4. Disassembly and Reassembly

Stop operation of the air conditioner and remove the power cord before repairing the unit.

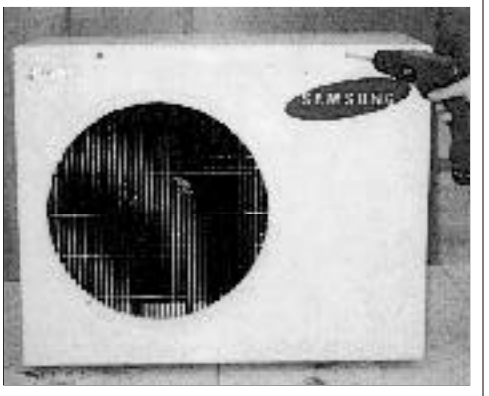
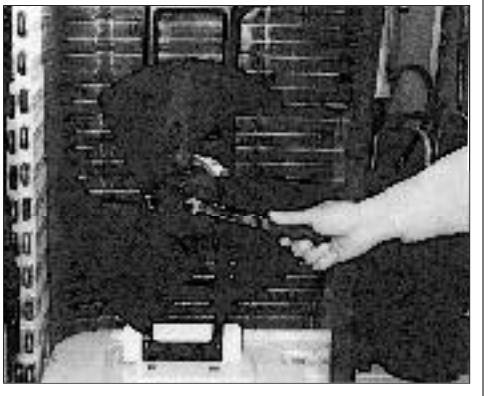
4-1 Indoor Unit

No	Parts	Procedure	Remark
1	Front Grille	1) Stop the air conditioner operation and block the main power. 2) Seperate tape of front panel upper.	
		3) Contract the second finger to the left, and right handle and pull to open the inlet grille. 4) Take the left and right filter out. * Take the Deadorizing and Electrostatic filter out. (ONLY “1” and “5” Series models) 5) Loosen one of the right fixing screw and seperate the terminal cover.	
		6) Loosen two fixing screws of front grille.	
		7) Pull the upper left and right of discharge softly for the outside cover to be pulled out.	
		8) Pull softly the lower part of discharge and push it up. **Caution;** Assemble the front panel and fix the hooks of left and right.	

No	Parts	Procedure	Remark
2	Ass'y Tray Drain.	1) Do "1", above. Separate the drain hose from the extension drain hose. 2) Take the display PCB out. (Center of indoor unit) 3) Loosen two fixing screws of left and right 4) Pull tray drain out from the back body.	
3	Electrical Parts (Main PCB)	1) Do "1", "2", above 2) Take all the connector of PCB upper side out. (Inclusion Power cord) 3) Separate the outdoor unit connection wire from the terminal block. 4) If pulling the Main PCB up. it will be taken out. (Separate the TRANS hook. it before).	
4	Heat Exchanger	1) Do "1" and "2", "3", above 2) Loosen two fixing earth screws of right side. 3) Separate the connection pipe. 4) Separate the bush body at the upper side and holder at the rearside. 5) Loosen the two fixing screws of left side. 6) Lifting the heat exchanger up a little to push the up side for separation from the indoor unit.	 

No	Parts	Procedure	Remark
3	Fan Motor and Cross Fan	1) Do “1” “2” ”3” “4”, above. 2) Loosen the fixing three screws and separate the motor holder. 3) Loosen the fixing screw of fan motor. (By use of M3 wrench) 4) Separate the fan motor from the fan. 5)Separate the fan from the left holder bearing.	 

4-2 Outdoor Unit

No	Parts	Procedure	Remark
1	Cabinet	1) Turn off the unit and remove the power cable 2) Remove the top cover. 3) Remove the control box cover. 4) Unplug the ass'y cable. 5) Remove the cabi-side. 6) Remove the cabi-front. * When you assemble the parts, check if the each parts and electric connectors are fixed firmly.	
2	Fan Motor & Propeller Fan	1) Do Procedure 1 above. 2) Remove the nut flange. (Turn to the right to remove as it is a left turned screw) 3) Disassemble the propeller fan.	

MEMO

5. Troubleshooting

5-1 Items to be checked first

1) Is the voltage of the power correct?
   The input voltage shall be rating voltage ±10%.
   The airconditioner may not operate properly if the voltage is out of this range.

2) Is the link cable linking the indoor unit and the outdoor unit linked properly?
   The indoor unit and the outdoor unit shall be linked by 6 cables.
   Check the terminals if the indoor unit and outdoor unit are properly linked by the same number of cables.
   Otherwise the airconditioner may not operate properly.

3) When a problem occurs due to the contents illustrated in the table below it is a symptom not related to the malfunction of the airconditioner.

NO	Operation of air conditioner	Explanation
1	The COOL operation indication LED (Green) blinks when a power plug of the indoor unit is plugged in for the first time.	It indicates power is on. The LED stops blinking if the operation ON/OFF button on the remote control unit is pushed.
2	In a COOL operation mode, the compressor does not operate at a room temperature higher than the setting temperature that the INDOOR FAN should operate. In a HEAT operation mode, the compressor does not operate at a room temperatrue lower than the setting temperature that indoor fan should operate.	In happens after a delay of 3 minutes when the compressor is reoperated. The same phenomenon occurs when a power is on. As a phenomenon that the compressor is reoperated after a delay of 3 minutes, the indoor fan is adjusted automatically with reference to a temperature of the air blew
3	Fan speed setting is not allowed in AUTO or DRY mode.	The speed of the indoor fan is set to LL in DRY mode. Fan speed is 5 steps is selected automatically in AUTO mode.
4	Compressor stops operation intermittently in DRY mode.	Compressor operation is controlled automatically in DRY mode depending on the room temperature and humidity.
5	Compressor of the outdoor unit is operating although it is turned off in a HEAT mode.	When the unit is turned off while de-ice is activated, the comperssor continues operation for up to 9 minutes (maximum) until the deice is completed.
6	Timer LED only of the indoor unit lights up and the air conditioner does not operate.	Timer is being activated and the unit is in ready mode. The unit operates normally if the timer operation is cancelled.
7	The compressor and indoor fan stop intermittently in HEAT mode.	The compressor and indoor fan stop intermittently if room temperature exceeds a setting temperature in order to protect the compressor from overheated air in a HEAT mode.
8	Indoor fan and outdoor fan stop operation intermittently in a HEAT mode.	The compressor operates in a reverse cycle to remove exterior ice in a HEAT mode, and indoor fan and outdoor fan do not operate intermtently for within 20% of the total heater operation
9	The compressor stops intermittently in a COOL mode or DRY mode, and fan speed of the indoor unit decreases.	The compressor stops intermittently or the fan speed of the indoor unit decreases to prevent inside/outside air frozen depending on the inside/outside air temperature.

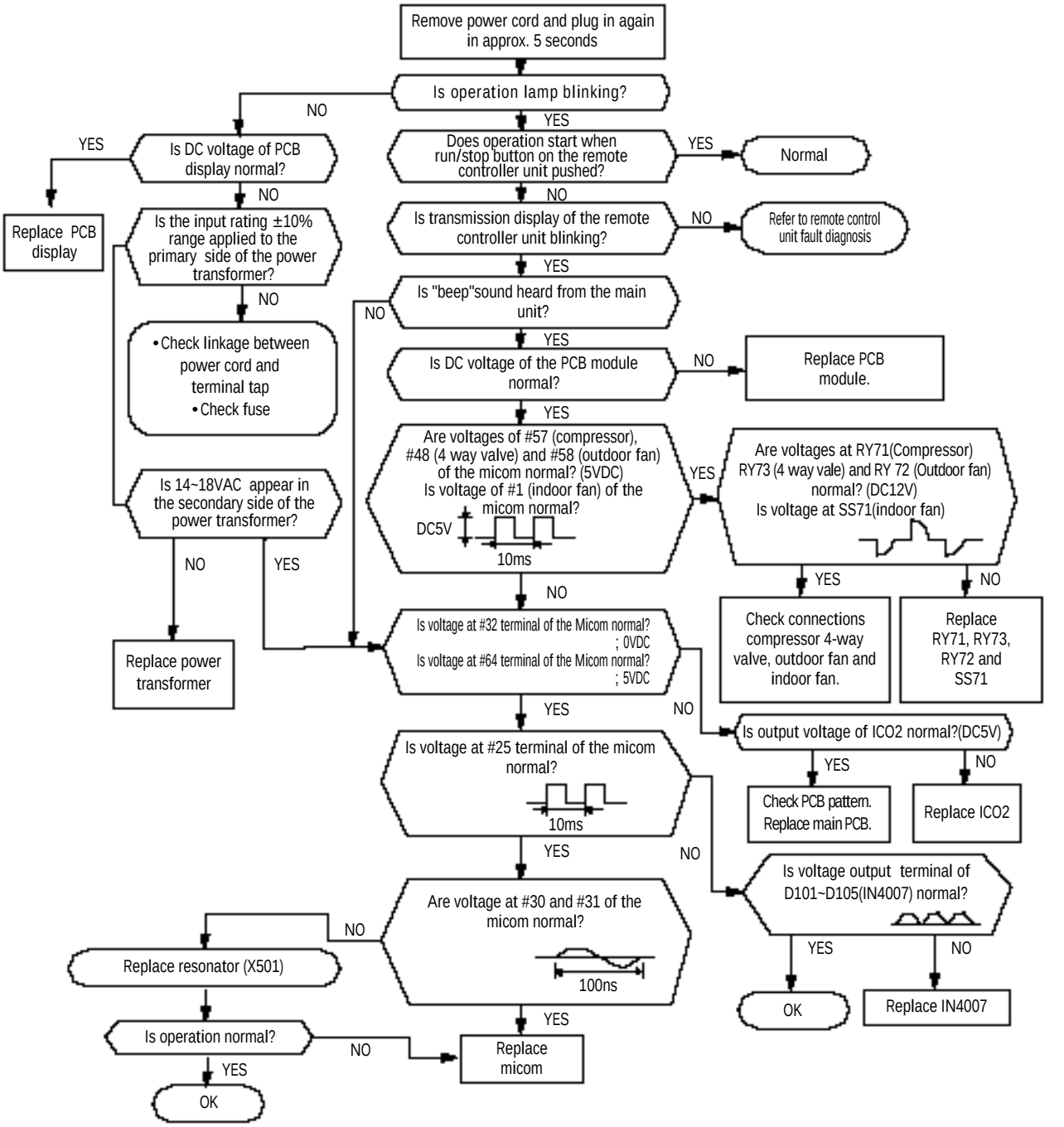
4) Indoor unit observes operation condition of the air conditioner, and displays self diagnosis details on the display panel.

NO	Display	Self Diagnosis
1	Operating LED blinking (1Hz)	Restore from power failure (input initial power)
2	TIMER LED blinking (1Hz)	Indoor unit Room sensor Error (open or short)
3	OPERATING and TIMER LED blinking (1Hz)	Indoor unit heat exchanger temperature sensor Error (open or short)
4	FAN LED blinking (1Hz)	Indoor fan malfunctioning (for spead is Below 38Orpm)

5-2 Fault Diagnosis by Symptom

5-2-1 No Power (completely dead)-Initial diagnosis

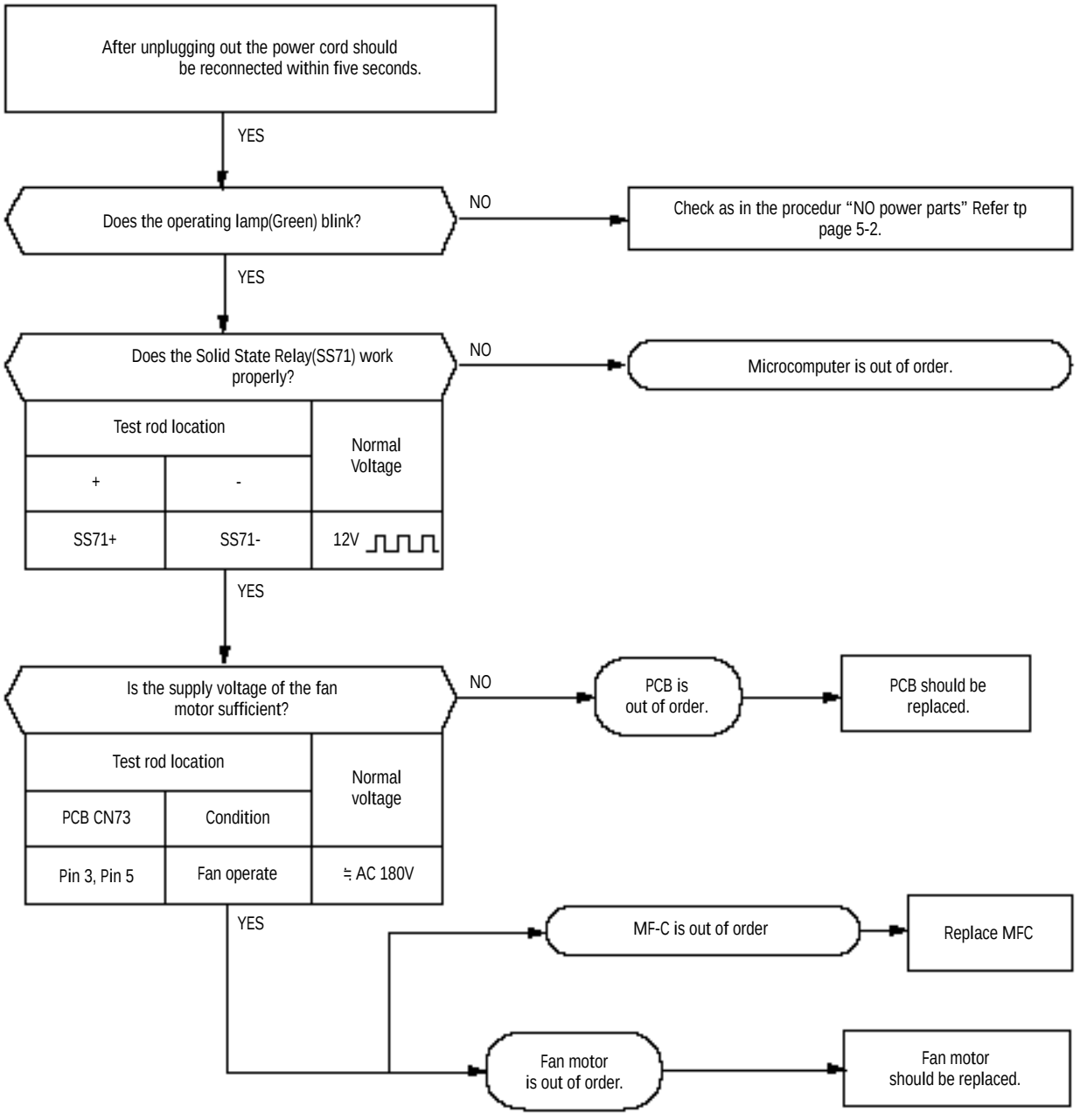
1) Checklist :
   (1) Is input voltage normal? (the rating voltage ±10% range)
   (2) Is AC power linked correctly?
   (3) Are connections between primary side, secondary side of the power transformer and PCB good.
   (4) Is output voltage of DC regulator IC KA7812 (IC01) normal? (11VDC-12.5VDC)
   (5) Is output voltage of DC regulator IC KA7805 (IC02) normal? (4.5VDC-5.5VDC)


Remove power cord and plug in again in approx. 5 seconds
Is operation lamp blinking?
NO
YES
Is DC voltage of PCB display normal?
YES
Replace PCB display
NO
Is the input rating ±10% range applied to the primary side of the power transformer?
NO
• Check linkage between power cord and terminal tap
• Check fuse
Is 14~18VAC appear in the secondary side of the power transformer?
NO
YES
Replace power transformer
Does operation start when run/stop button on the remote controller unit pushed?
YES
Normal
NO
Is transmission display of the remote controller unit blinking?
NO
Refer to remote control unit fault diagnosis
YES
Is "beep"sound heard from the main unit?
NO
YES
Is DC voltage of the PCB module normal?
NO
Replace PCB module.
YES
Are voltages of #57 (compressor), #48 (4 way valve) and #58 (outdoor fan) of the micom normal? (5VDC)
Is voltage of #1 (indoor fan) of the micom normal?
DC5V
10ms
YES
Are voltages at RY71(Compressor) RY73 (4 way vale) and RY 72 (Outdoor fan) normal? (DC12V)
Is voltage at SS71(indoor fan)
YES
NO
Check connections compressor 4-way valve, outdoor fan and indoor fan.
Replace RY71, RY73, RY72 and SS71
NO
Is voltage at #32 terminal of the Micom normal? ; 0VDC
Is voltage at #64 terminal of the Micom normal? ; 5VDC
YES
NO
Is output voltage of ICO2 normal?(DC5V)
YES
NO
Check PCB pattern. Replace main PCB.
Replace ICO2
Is voltage at #25 terminal of the micom normal?
10ms
YES
NO
Is voltage output terminal of D101~D105(IN4007) normal?
YES
NO
OK
Replace IN4007
Are voltage at #30 and #31 of the micom normal?
100ns
NO
YES
Replace resonator (X501)
Is operation normal?
NO
YES
Replace micom
OK

5-2-2 When the Indoor Unit Fan Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is the indoor unit fan motor properly connected with the connector (CN73)?
   (2) Is the AC voltage correct?
   (3) Is HALL IC in indoor fan motor properly connected with the connector (CN43)?
   (4) Is the running capacitor properly connected with the solder part of the PCB?

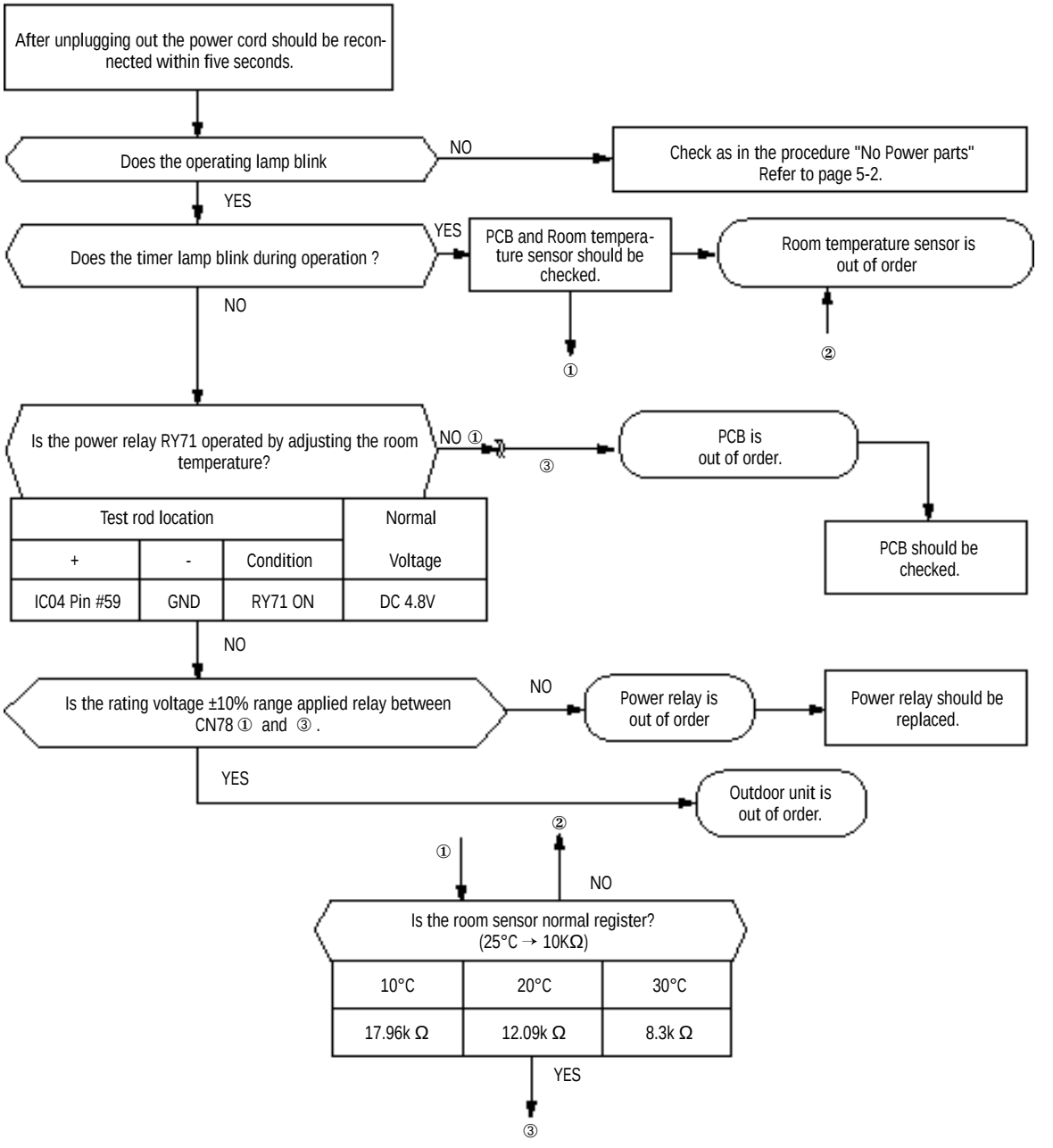
2) Troubleshooting procedure



5-2-3 When the Outdoor Unit Does Not Operate. (Initial Diagnosis)

1) Checklist :
   (1) Is input voltage normal? (the rating voltage ±10% range)
   (2) Is the set temperature of the remote control higher than room temperature in COOL mode?
   (3) Is the set temperature of the remote control lower than room temperature in HEAT mode?
   (4) Is the POWER IN connector (CN78) linked correctly?
   (5) Is the outdoor unit properly connected with the TERMINAL BLOCK connector(7P)?

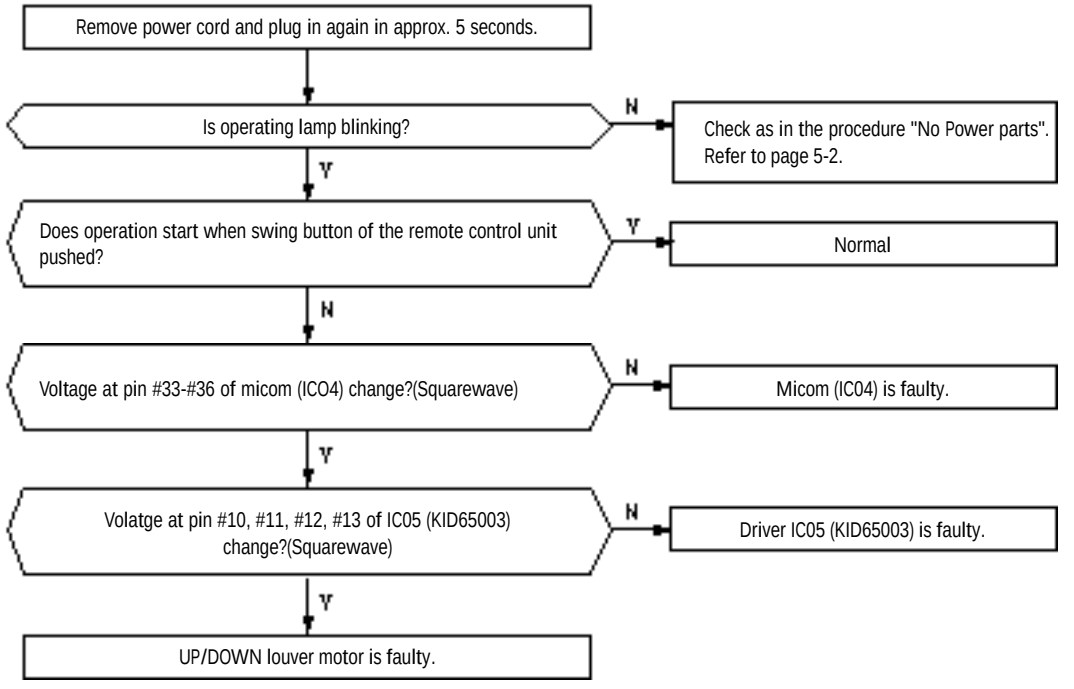
2) Troubleshooting procedure



5-2-4 When the UP/DOWN Louver Moter Does Not Operate. (Initial Diagnosis)

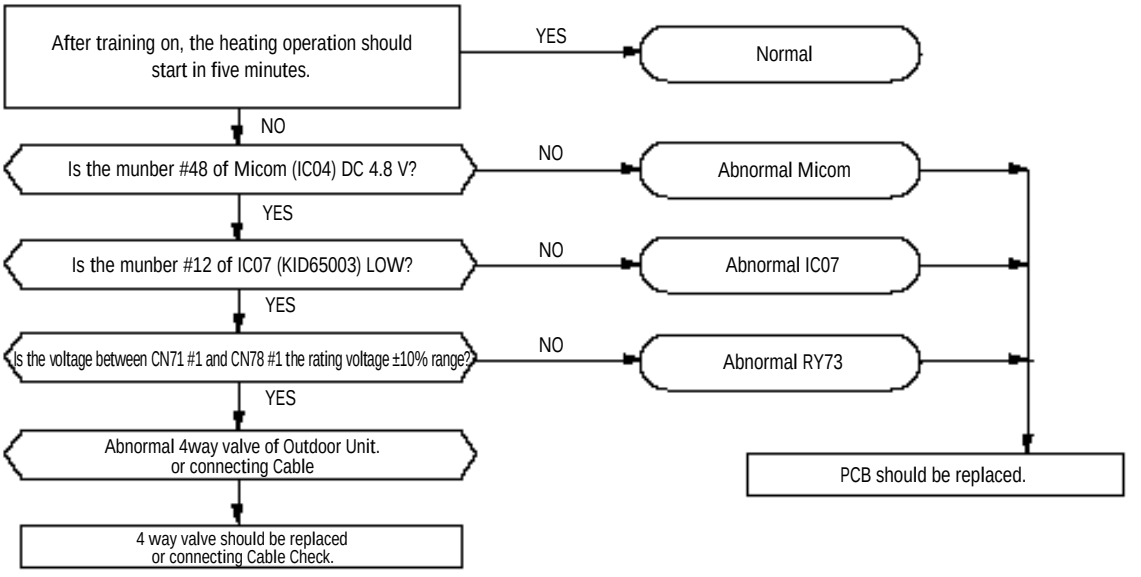
1) Checklist :
   (1) Is input voltage normal? (the rating voltage ±10% range)
   (2) Is the UP / DOWN louver motor properly connected with the connector (CN61)?

2) Troubleshooting procedure


Remove power cord and plug in again in approx. 5 seconds.
Is operating lamp blinking?
N
Check as in the procedure "No Power parts". Refer to page 5-2.
Y
Does operation start when swing button of the remote control unit pushed?
Y
Normal
N
Voltage at pin #33-#36 of micom (IC04) change?(Squarewave)
N
Micom (IC04) is faulty.
Y
Volatge at pin #10, #11, #12, #13 of IC05 (KID65003) change?(Squarewave)
N
Driver IC05 (KID65003) is faulty.
Y
UP/DOWN louver motor is faulty.

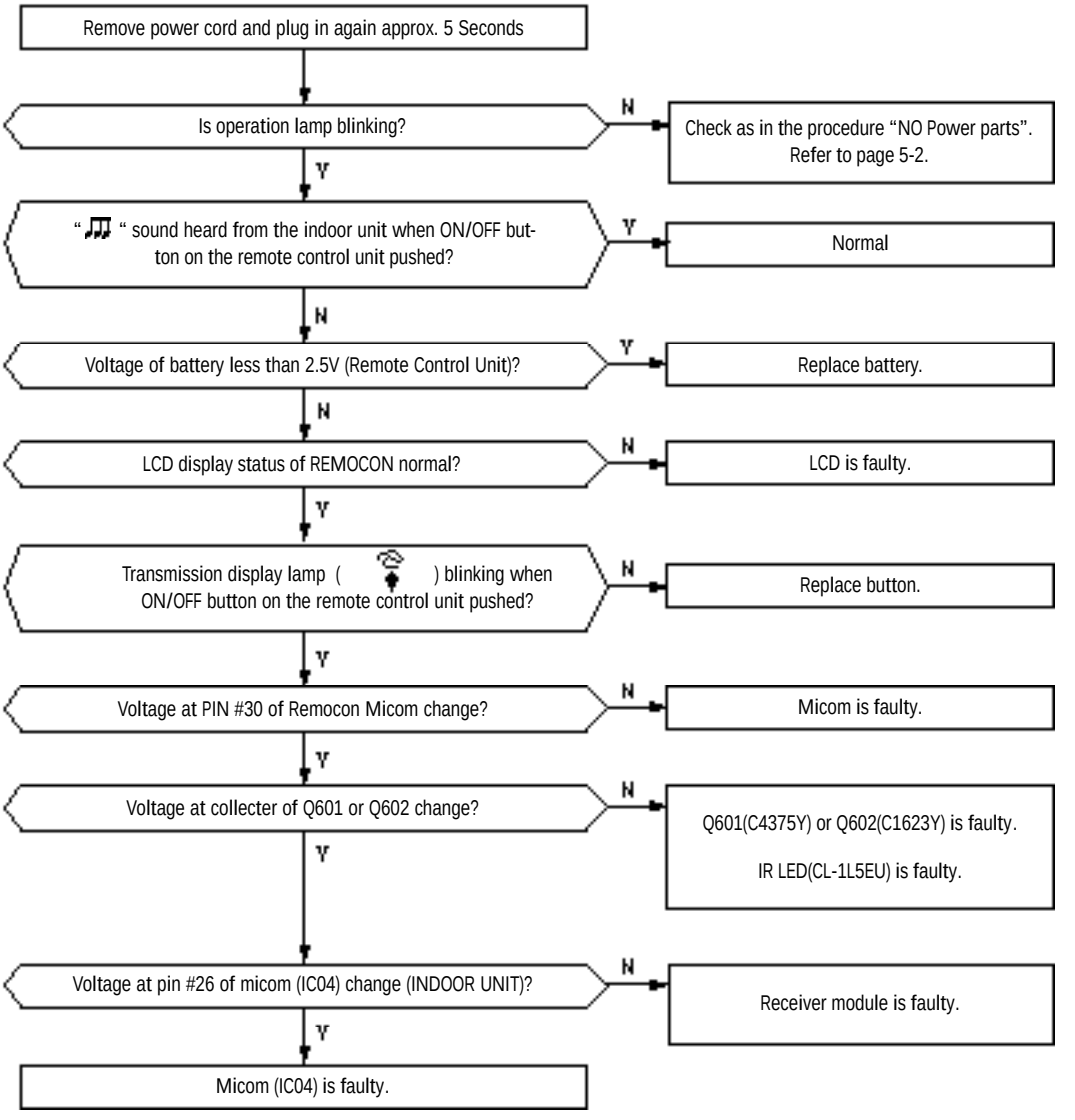
5-2-5 In the Heat mode, When there is no warm air current. Check this first;

(1) Is the set temperature of Remote Control lower than room temperature in Heat mode?
(2) Is the Indoor PCB properly connected with the CN71 and CN78 connector?


After training on, the heating operation should start in five minutes.
YES
Normal
NO
Is the munber #48 of Micom (IC04) DC 4.8 V?
NO
Abnormal Micom
YES
Is the munber #12 of IC07 (KID65003) LOW?
NO
Abnormal IC07
YES
Is the voltage between CN71 #1 and CN78 #1 the rating voltage ±10% range?
NO
Abnormal RY73
YES
Abnormal 4way valve of Outdoor Unit. or connecting Cable
4 way valve should be replaced or connecting Cable Check.
PCB should be replaced.

5-2-6 If Operation By Remote Control Unit Is Impossible. (Initial Diagnosis)

1) Troubleshooting procedure


Remove power cord and plug in again approx. 5 Seconds
Is operation lamp blinking?
N
Check as in the procedure "NO Power parts". Refer to page 5-2.
Y
" ♫ " sound heard from the indoor unit when ON/OFF button on the remote control unit pushed?
Y
Normal
N
Voltage of battery less than 2.5V (Remote Control Unit)?
Y
Replace battery.
N
LCD display status of REMOCON normal?
N
LCD is faulty.
Y
Transmission display lamp ( ) blinking when ON/OFF button on the remote control unit pushed?
N
Replace button.
Y
Voltage at PIN #30 of Remocon Micom change?
N
Micom is faulty.
Y
Voltage at collecter of Q601 or Q602 change?
N
Q601(C4375Y) or Q602(C1623Y) is faulty.
IR LED(CL-1L5EU) is faulty.
Y
Voltage at pin #26 of micom (IC04) change (INDOOR UNIT)?
N
Receiver module is faulty.
Y
Micom (IC04) is faulty.

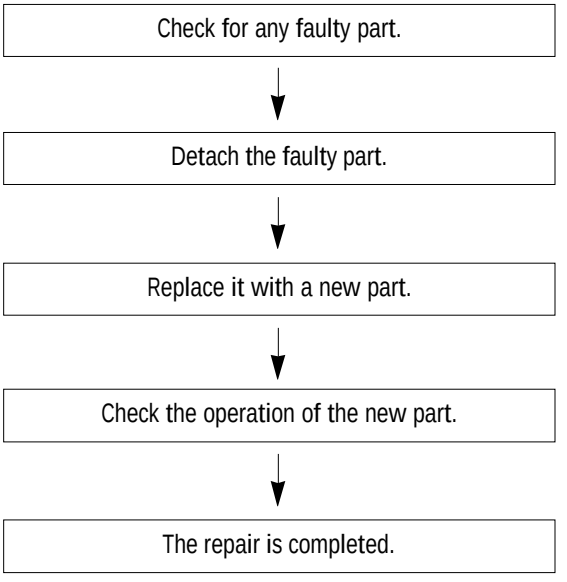
5-3 PCB Inspection

5-3-1 Cautions for Part Replacement

1. The human body carries much static electricity. Before touching a part for repair, replacement or the similar purpose, be sure to touch a grounded metallic portion by hand to let the static electricity go through the matallic portion to the earth. Espectially when handling any micro computer or IC, carefully remove such static electricity before touching them.
2. When repairing any part on a work bench, be sure to place an insulative sheet on the bench and always keep the sheet surface neat without any metal fragments. If any such fragment touches a part, a secondary trouble will possibly be caused in the part.
3. Before replacing any parts, be sure to turn off the power supply. If such replacement is done with the power supply kept on, an electric shock, short circuit or destruction of a part may result.
4. During replacement or repair of a part, carefully handle it : The printed circuit board has fine lead wires (jumper wires) and glass-made parts (diode) on its substrate. So if a circuit board is roughly handled, such lead wires and parts will be easily broken or damaged by bending or shock.
5. When soldering the lead wires of any new part, be sure to polish them using an emery paper or the like before solding them. Since the lead wires of any new part are covered with an oxide film, solder cannot adhere to the lead wires if not polished.
6. When soldering any part, care should be exercised not to apply any high-wattage soldering iron to the part for a long time. Some parts are of so low a heat resistance that they may be broken or have the properties changed if a soldering iron is so applied (Otherwise, the pattern may possibly be separated and raised).
7. The heat of the soldering iron should be transfered to the entire object to be soldered. If the solder pieces are not well fused due to insufficient transfer of the heat from the soldering iron, no satisfactory electrical continuity can be assured even if the soldered objects appear well connected to each other.
8. The solder used should be limited to a minimum. If excessive solder is used, it will cause inter-pattern contact, which may cause malfunction of the circuit.

5-3-2 Procedure

The parts should be replaced in the following procedure.


Check for any faulty part.
Detach the faulty part.
Replace it with a new part.
Check the operation of the new part.
The repair is completed.

5-3-3 Detailed Procedure

No.	Malfunction	Checking point (symptoms)	Causes
1	Pull out the power plug from the AC terminal and confirm the fuse on the PCB assembly	1. Is the broken?	1. Voltage over 2. Indoor unit fan motor short-circuit.
2	Turn the power on. If lamp blinks trouble is not related to the items 1 through 4 on the right.	Voltage check	
		1. AC voltage at both end of transformer Primary? ; rating voltage ±10% range	1. Irregular power code or power fuse, or poor wiring.
		2. AC voltage at both end of transformer secondary? ; 14- 18Vac	2. Transformer is faulty.
		3. DC voltage at OUT and GND of IC01 (KA7812)? ; 12VDC	3. Power circuit is faulty.
		4. DC voltage at OUT and GND of IC02? ; 5VDC	4. Power circuit is faulty.
		5. DC voltage at Q201 Base and GND change? ; squarewave	5. Q201 is faulty. D101~D104 (IN4007)
3	Set operating mode when RMC switch pushed. Except for [FAN]mode and [TIMER] mode.	Voltage check	
		1. Voltage of relay (RY71) coil Voltage at PIN#11, PIN#12, PIN#15 of IC07 ; 12VDC	1. Relay(RY 71) coil is open. IC07 is faulty.
		2. Voltage at Terminal Tap (TB71 or 72) and RY71 Terminal N0 ④ ; rating voltage ±10% range	2. Relay(RY 71) contactor is faulty.
4	Set operating mode when RMC switch pushed. 1. COOL mode 2. TURBO operating	1. Compressor does not operate.	1. PCB is faulty. 2. Connecting is faulty.
5	Set operating mode when RMC switch pushed. 1. HEAT mode 2. TURBO operating	1. Compressor does not operate	1. PCB is faulty. 2. Connecting is faulty.
6	Set operating mode when RMC switch pushed. 1. [FAN] mode 2. Fan speed [Hi] 3. Continuously operation	1. Voltage at ③⑤ both ends of CN73 : above 180V~	1. Indoor unit fan motor is faulty.
		2. Indoor unit fan motor does not operate.	2. Poor connection of indoor fan motor and connector of RPM sensing (CN43)

5-4 Fault Diagnosis of Major Parts

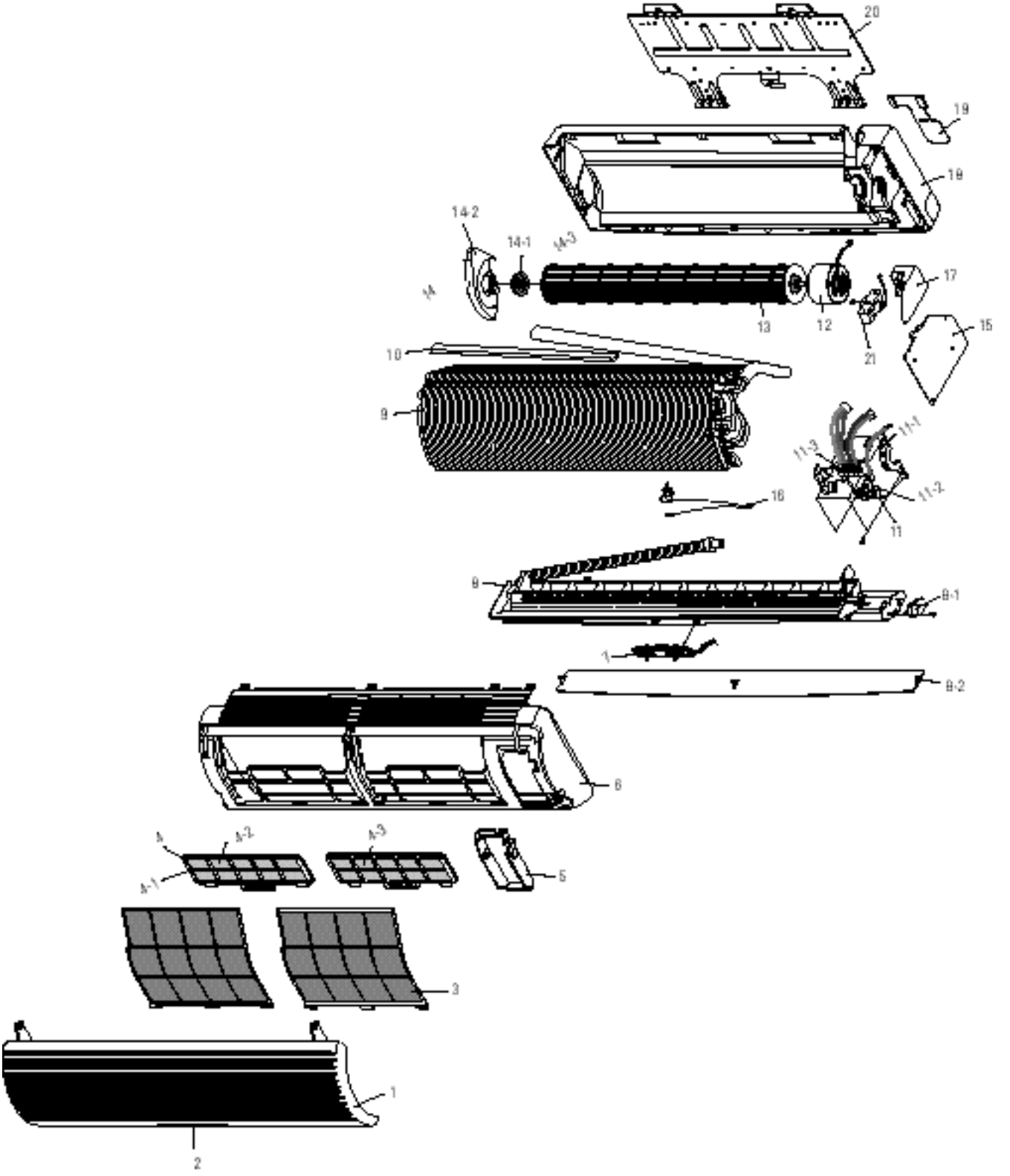
<table>
<tr><th>Parts</th><th colspan="2">Diagnosis</th></tr>
<tr><td rowspan="11">Temp.Sensor
Heat ex. Sensor

Indoor Fan Motor

Outdoor Fan Motor</td><td colspan="2">Measure resistance with a tester.</td></tr>
<tr><td>Normal</td><td>8KΩ~27KΩ at ambient temperature (+0°C ~ +30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
<tr><td colspan="2">Measure resistance between terminals (CN73) with a tester</td></tr>
<tr><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Red, Yellow</td><td>190±10Ω</td></tr><tr><td>Red, Blue</td><td>170±10Ω</td></tr></table></td></tr>
<tr><td>Abnormal</td><td></td></tr>
<tr><td colspan="2">Measure the voltage between ground and signal wire of the fan motor</td></tr>
<tr><td>Normal</td><td><table><tr><th>between</th><th>Voltage</th></tr><tr><td>Gray, Orange</td><td>0.5V~4.5V</td></tr><tr><td>Yellow, Orange</td><td>5V</td></tr></table></td></tr>
<tr><td>Abnormal</td><td>Abnormal if voltage does not change from 0V to 5V.</td></tr>
<tr><td>Normal</td><td>At ambient temperature (10°C ~ 30°C)
<table><tr><th>between</th><th>Resistance</th></tr><tr><td>Black, White</td><td>350±10Ω</td></tr><tr><td>Black, Red</td><td>270±10Ω</td></tr></table></td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
<tr><td rowspan="3">Stepping Motor
(UP/DOWN swing motor)</td><td colspan="2">Measure resistance between red wire and each terminal.</td></tr>
<tr><td>Normal</td><td>Approx. 380Ω at ambient temperature (20°C ~30°C)</td></tr>
<tr><td>Abnormal</td><td>∞, 0 Ω … open or short</td></tr>
</table>

6. Exploded Views and Parts List

6-1 Indoor Unit

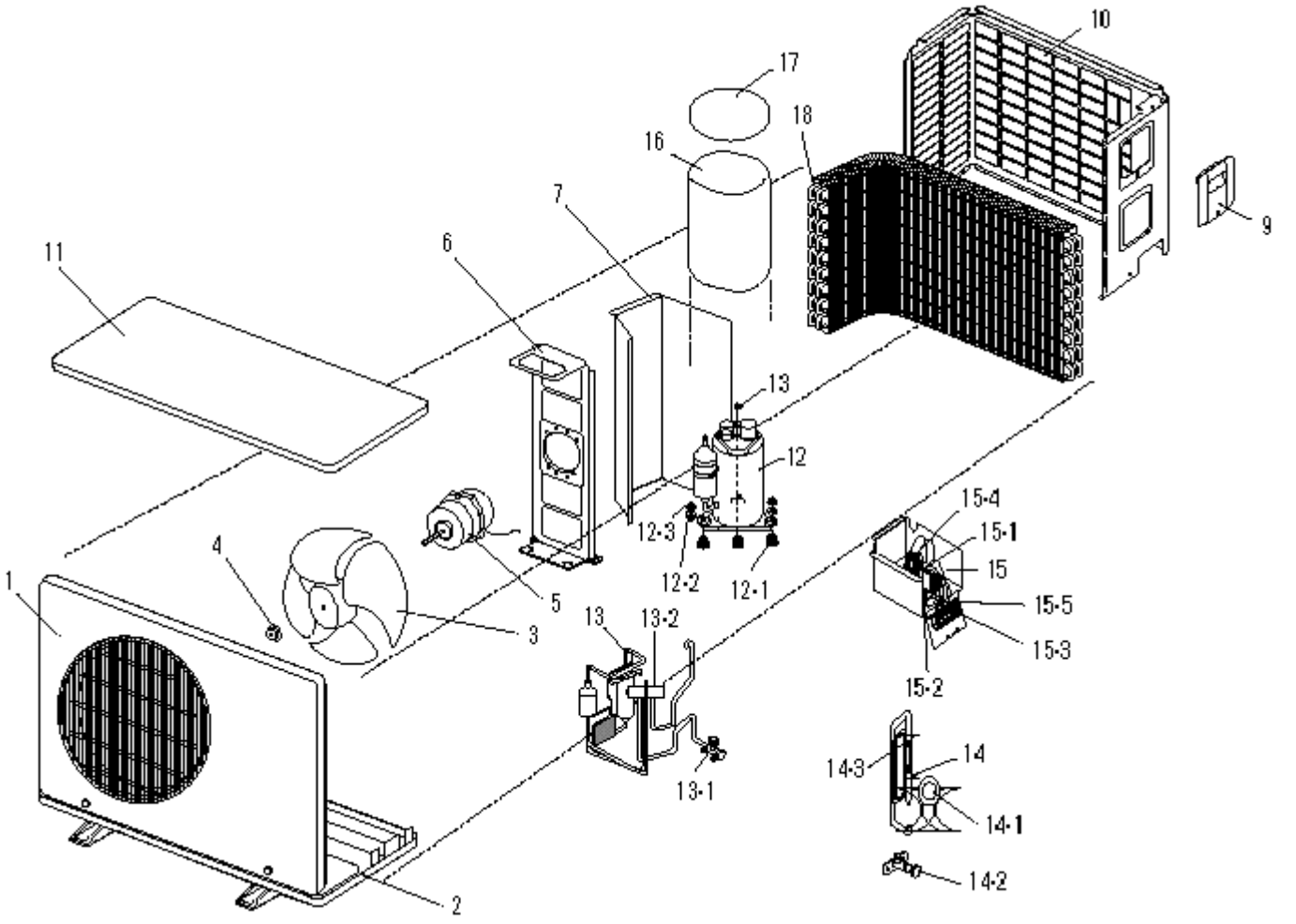


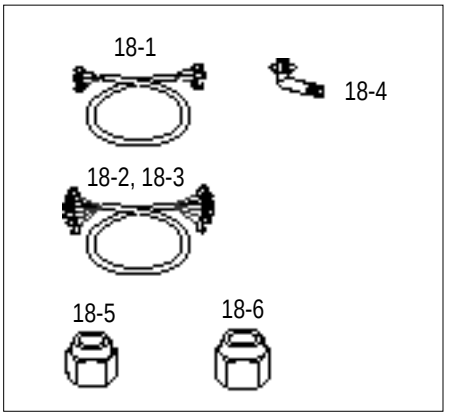
■ Parts List

No.	CODE NO	Description	Specification	Q'TY				Remark
				AQT24A1(B1)QE AQT24A2(B2)QE SH24ZV	AQT24A1(B1)QB AQT24A2(B2)QB	AQ18A1(B1)QE AQ18A2(B2)QE SH18ZV	AQ18A1(B1)QB AQ18A2(B2)QB	
1	DB64-10173A	GRILLE AIR INLET	HIPS	1(A1,A2)	1(A1,A2)	1(A1,A2)	1(A1,A2)	
	DB64-10151A	GRILLE AIR INLET	HIPS	1(B1,B2)	1(B1,B2)	1(B1,B2)	1(B1,B2)	
2	DB64-70108A	PANEL CENTER DISPLAY	PC	1(A1,A2)	1(A1,A2)	1(A1,A2)	1(A1,A2)	
	DB64-70077A	PANEL CENTERDISPLAY	PC	1(B1,B2)	1(B1,B2)	1(B1,B2)	1(B1,B2)	
3	DB63-30150B	GUARD AIR FILTER	PP	2	2	2	2	
4	DB74-10101B	CLEANER FILTER ASS'Y	ASS'Y	1	1	1	1	
4-1	DB61-10164B	CASE-CLEANER FILTER	PP	2	2	2	2	
4-2	DB74-10082A	DEODORIZING FILTER	POLYESTER/CARBON	1	1	1	1	
4-3	DB74-10081A	CLEANER FILTER	POLYESTER/COTTON	1	1	1	1	
5	DB63-10466A	COVER TERMINAL	ABS(V0)	1	1	1	1	
6	DB92-70095A	ASS´Y FRONT PANEL	HIPS	1	1	1	1	
7	DB93-10599B	ASS´Y PCB DISPLAY	ASS'Y	1(A1,A2)	1(A1,A2)	1(A1,A2)	1(A1,A2)	
	DB93-10600B	ASS´Y PCB DISPLAY	ASS'Y	1(B1,B2)	1(B1,B2)	1(B1,B2)	1(B1,B2)	
8	DB94-10083D	ASS´Y TRAY DRAIN	ASS'Y	1	1	1	1	
8-1	DB31-10153B	ASS´Y STEPPING MOTOR	MSFCC20A03	1	1	1	1	
8-2	DB66-30181A	BLADE-H	ABS	1	1	1	1	
9	DB75-40087G	ASS´Y EVAP	PLATE1.2(5/8")	1	1	-	-	
	DB75-40087H	ASS´Y EVAP	SLIT1.5(1/2")	-	-	1	1	
10	DB67-30089A	SPACER EVAP	PVC	1	1	1	1	
11	DB90-40162A	ASS´Y HOLDER MOTOR	ASS'Y	1	1	1	1	
11-1	DB61-40264A	HOLDER MOTOR	PP(VO)	1	1	1	1	
11-2	DB65-10108A	CLIP EARTH WIRE	SECC	1	1	1	1	
11-3	DB65-40063A	TERMINAL BLOCK ASS´Y	5P,25A	1	1	1	1	⚠
12	DB31-10151A	MOTOR FAN IN	IC-9430SKJ5A	1	-	1	-	⚠
	DB31-10151B	MOTOR FAN IN	IC-9430SKF6A	-	1	-	1	⚠
13	DB94-30162C	ASS´Y-C-F-FAN	ø95 x L	1	1	1	1	
14	DB90-40135A	ASS´Y HOLDER BEARING	ASS'Y	1	1	1	1	
14-1	DB94-40003A	RUBBER BEARING	CR	1	1	1	1	
14-2	DB61-40244A	HOLDER BEARING	PP	1	1	1	1	
14-3	DB94-40007A	BEARING	PG5	1	1	1	1	
15	DB93-10545B	ASS´Y MAIN PCB	PD-S18B1Q-03	1(A1,B1)	1(A1,B1)	-	-	
	DB93-10545D	ASS´Y MAIN PCB	PD-S18B1Q-06	1(A2,B2)	1(A2,B2)	-	-	
	DB93-10555E	ASS´Y MAIN PCB	PD-S18B1Q-09	-	-	1(A1,B1)	1(A1,B1)	
	DB93-10555F	ASS´Y MAIN PCB	PD-S18B1Q-11	-	-	1(A2,B2)	1(A2,B2)	
16	DB32-10008E	ASS´Y-TERMISTOR	103AT	1	1	1	1	
17	DB61-10163A	CASE-CONTROL	ABS(VO)	1	1	1	1	
18	DB94-20037B	ASS´Y-BACK BODY	HIPS	1	1	1	1	
19	DB61-40264A	HOLDER PIPE	PP	1	1	1	1	
20	DB70-10663A	PLATE HANGER	SGCC-M	1	1	1	1	
21	DB26-10065B	TRANSFORMER	AC230V / DC17V	1	1	1	1	⚠

6-2 Outdoor Unit

6-2-1 18K BTU

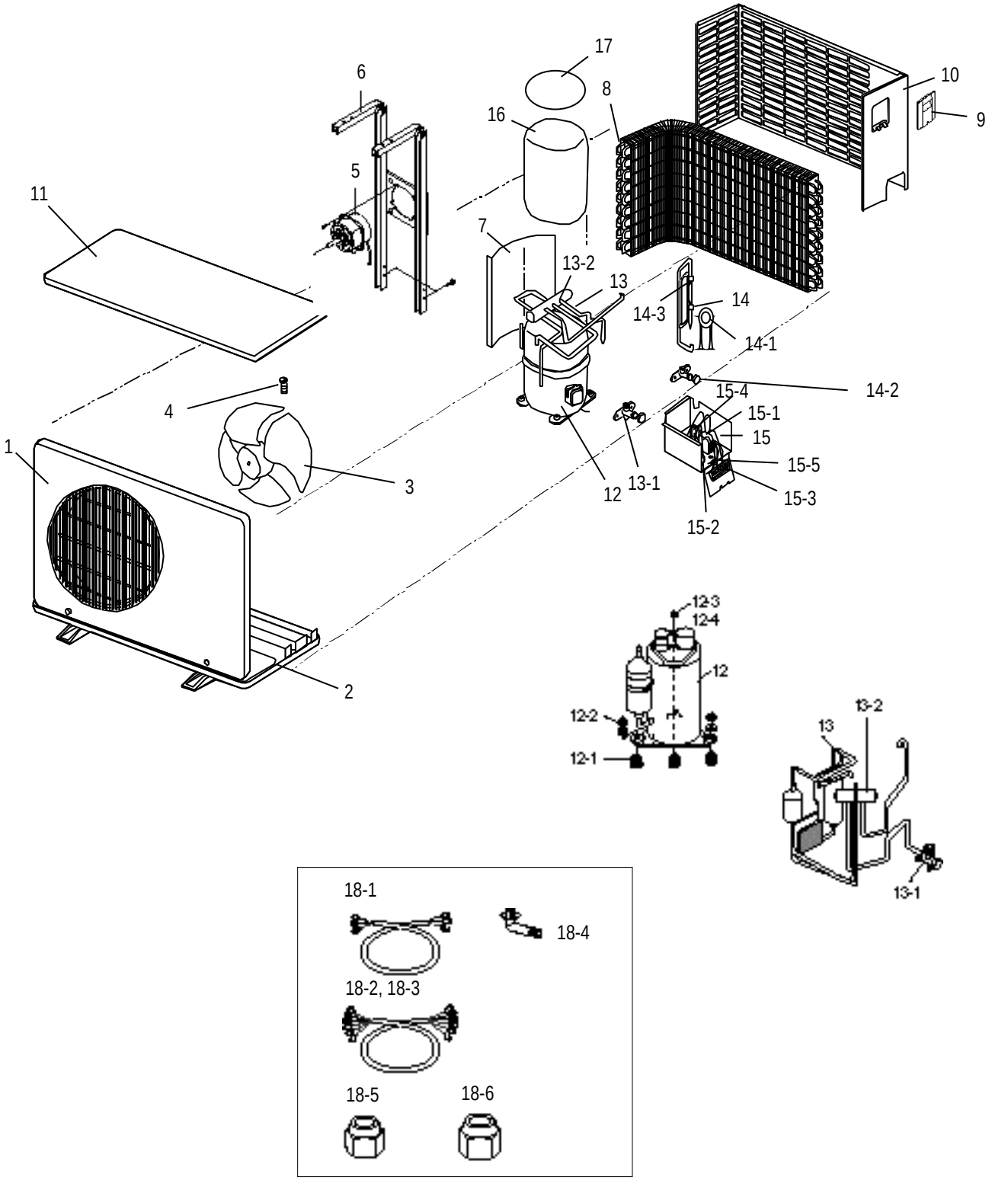




■ Parts List(18K)

No.	CODE NO	Description	Specification	Q'TY		Remark
				UQ18A1(B1)QE UQ18A2(B2)QE XSH18ZV	UQ18A1(B1)QB UQ18A2(B2)QB	
1	DB90-00033A	ASS'Y-WELD FRONT	SC-90073T	1	1	
2	DB90-20160D	ASS'Y-BASE OUT	SC-90073T	1	1	
3	DB67-50063A	ASS'Y-FAN	AS+G/F20%	1	1	
4	DB60-30020A	NUT FLANGE	M6LF	1	1	
5	DB31-10119C	MOTOR FAN OUT	AMASS-035AVEB	1	-	⚠
	DB31-10119A	MOTOR FAN OUT	AMASS-035ZTEA	-	1	⚠
6	DB61-20008C	BASE-MOTOR	SGCC-M	1	1	
7	DB94-50034A	PARTITION	SGCC-M	1	1	
8	DB75-30103A	ASS'Y-CONDENSER	ASS'Y	1	1	
9	DB90-40176B	ASS'Y COVER-CONTROL	ABS(V5)	1	1	
10	DB64-60172A	ASS'Y-CABI BACK	SC-90073T	1	1	
11	DB90-40124A	TOP COVER	SC-90073T	1	1	
12	DB95-10263B	COMPRESSOR	48B180JV1E7	1	-	
	DB95-10263A	COMPRESSOR	48B190JV2E7	-	1	
12-1	DB73-10004A	GROMMET ISOLATOR	EPDM	3	3	
12-2	DB60-30028A	NUT WASHER	M8	3	3	
12-3	DB60-30018A	NUT-FLANGE	M5	1	1	
12-4	DB63-10165A	COVER-TERMINAL	NORYL	1	1	
13	DB99-10134A	ASS'Y-4WAY V/V	UQ18A1QE	1	1	
13-1	DB62-40074C	PACKED V/V 1/2"	10LT/MIN	1	1	
13-2	DB62-40036A	4WAY V/V	CHV-0201	1	1	
14	DB99-10136A	ASS'Y CHECK V/V	UQ18A1QE	1	1	
14-1	DB62-31800B	TUBE-CAPI(C)	C1220T-0	1	1	
14-2	DB62-40039B	PACKED V/V 1/4"	1/4 INCH	1	1	
14-3	DB62-31802B	TUBE-CAPI(H)	C1220T-0	1	1	
15	DB93-00110B	ASS'Y CONTROL OUT	UQ18A1QE	1	-	
	DB93-40736B	ASS'Y CONTROL OUT	UQ18A1QB	-	1	
15-1	DB34-90057C	SWITCH MAGNET	45CG20ALB	1	-	
	DB34-90057A	SWITCH MAGNET	45CG20AGB	-	1	
15-2	2501-001139	CAPACITOR DUAL	40/2.5,450V	1	1	
15-3	DB65-40022D	TERMINAL BLOCK	7P/20A	1	1	
15-4	DB95-90026B	SPARK KILLER	-	1	1	
15-5	3601-000236	FUSE	2A,250V	1	1	
16	DB72-50537A	CLOTH SOUND	-	1	1	
17	DB72-50544A	CLOTH SOUND UPP	-	1	1	
18-1	DB39-20546A	CONNECTOR POWER	3G,2.5mm^2	1	1	
18-2	DB39-10058A	CONNECTOR WIRE	4G,1.0mm^2	1	1	
18-3	DB39-20235A	CONNECTOR WIRE	2G,0.75mm^2	1	1	
18-4	DB67-20011A	DRAIN ;LUG OUT	PP	1	1	
18-5	DB60-30010A	NUT FLANGE 1/4"	C3771BD	2	2	
18-6	DB60-30010C	NUT FLANGE 1/2"	C3771BD	2	2	

6-2-2 24K BTU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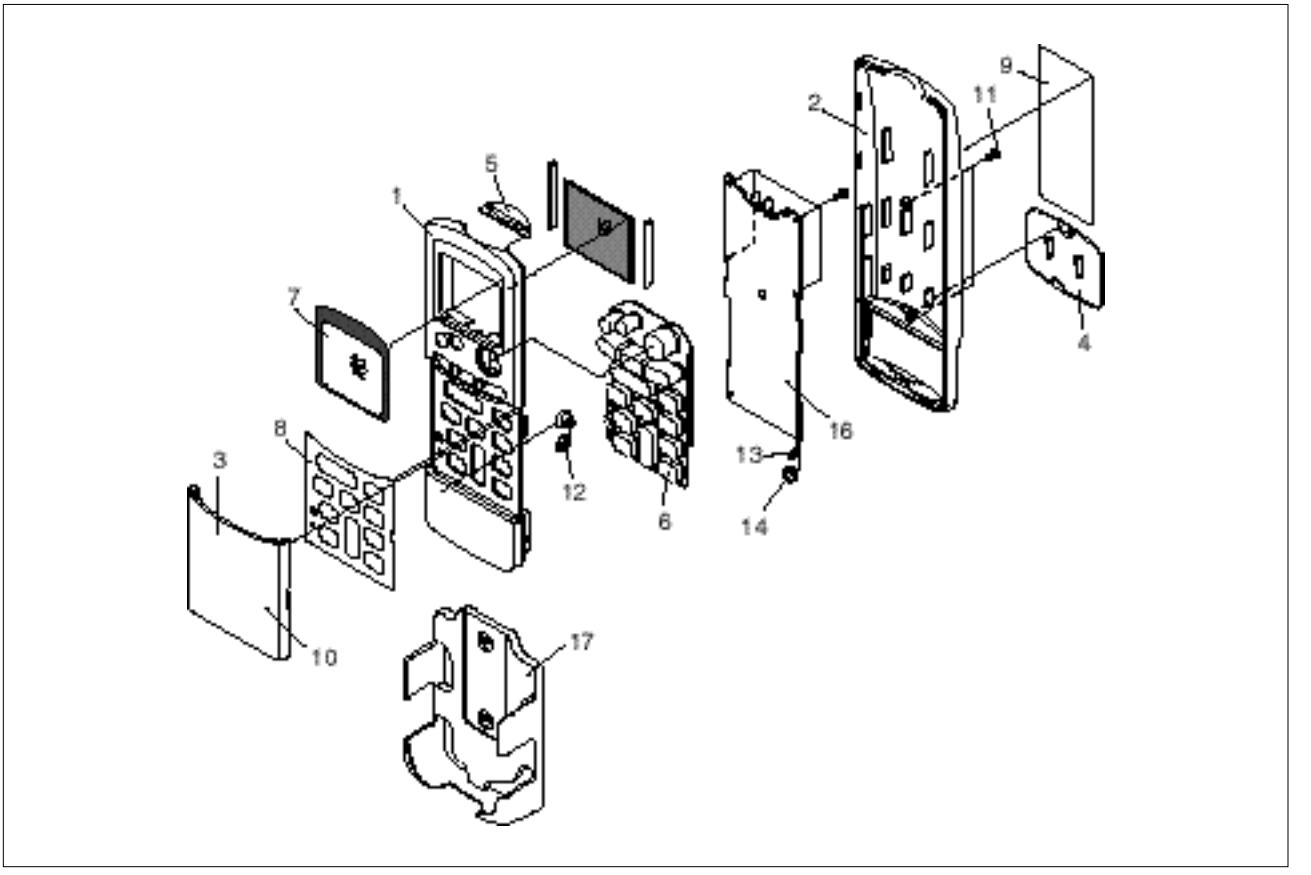
■ Parts List(24K)

No.	CODE NO	Description	Specification	Q'TY		Remark
				UQT24A1(B1)QE UQT24A2(B2)QE XSH24ZV	UQT24A1(B1)QB UQT24A2(B2)QB	
1	DB90-10634A	ASS'Y-WELD FRONT	SC-90073T	1	1	
2	DB90-20210A	ASS'Y-BASE OUT	SC-90073T	1	1	
3	DB67-50074A	ASS'Y-FAN	AS+G/F20%	1	1	
4	DB60-20020A	BOLT-SPECIAL	M6LF	1	1	
5	DB31-10110E	MOTOR FAN OUT	OSME-716SRC	1	1	⚠
6	DB95-20147A	ASS'Y-MOTOR B/K	SGCC-M	1	1	
7	DB94-50039A	PARTITION	SGCC-M	1	1	
8	DB75-30102D	ASS'Y-CONDENSER	ASS'Y	1	1	
9	DB90-40176B	ASS'Y COVER-CONTROL	ABS(V5)	1	1	
10	DB64-60160C	ASS'Y-CABI OUT	SC-90073T	1	1	
11	DB90-10616A	TOP COVER	SC-90073T	1	1	
12	DB95-10351A	COMPRESSOR	AWG5532EXC	1	-	
	DB95-10351E	COMPRESSOR	AWG5532EXN	-	1	
13	DB99-10135A	ASS'Y-4WAY V/V	UQT24A1QE/B	1	1	
13-1	DB62-40055F	PACKED V/V 1/2"	10LT/MIN	1	1	
13-2	DB62-40036A	4WAY V/V	CHV-0201	1	1	
14	DB96-10138C	ASS'Y CHECK V/V	UQT24A1QE/B	1	1	
14-1	DB62-31798C	TUBE-CAPI (C)	C1220T-0	1	1	
14-2	DB62-40039C	PACKED V/V 1/4"	1/4 INCH	1	1	
14-3	DB62-31802F	TUBE-CAPI (H)	C1220T-0	1	1	
15	DB93-40735B	ASS'Y CONTROL OUT	UQT24A1QE	1	-	
	DB93-40735D	ASS'Y CONTROL OUT	UQT24A1QB	-	1	
15-1	DB34-90054A	SWITCH MAGNET	41NB21AL	1	-	
	DB34-90054B	SWITCH MAGNET	41NB21AG	-	1	
15-2	2501-001153	CAPACITOR DUAL	45/3.0, 450V	1	-	
	2501-001152	CAPACITOR DUAL	35/3.0, 450V	-	1	
15-3	DB65-40022D	TERMINAL BLOCK	7P/20A	1	1	
15-4	DB95-90026B	SPARK KILLER	-	1	1	
15-5	3601-000236	FUSE	2A,250V	1	1	
16	DB72-50622A	CLOTH SOUND COMP	-	1	1	
17	DB72-50614A	CLOTH SOUND UPP	-	1	1	
18-1	DB39-20546A	CONNECTOR POWER	3G,2.5mm^2	1	1	
18-2	DB39-10058A	CONNECTOR WIRE	4G,1.0mm^2	1	1	
18-3	DB39-20235A	CONNECTOR WIRE	2G,0.75mm^2	1	1	
18-4	DB67-20011A	DRAIN PLUG OUT	PP	1	1	
18-5	DB60-30010A	NUT FLANGE 1/4"	C3771BD	2	2	
18-6	DB60-30010D	NUT FLANGE 1/2"	C3771BD	2	2	

6-3 Remote Control & PCB Box

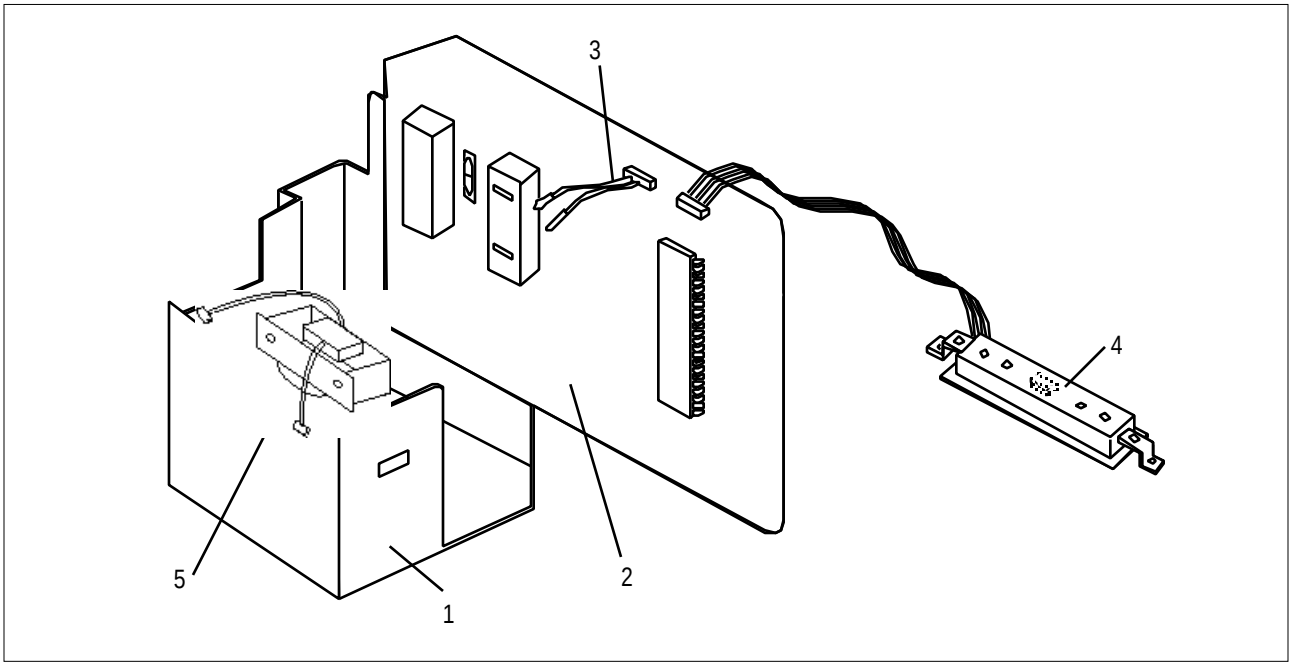
6-3-1 Remote Control (DB93-30073B)



■ Parts List

No	CODE NO	Description	Specification	Q'TY	Remark
1	DB61-10144A	CASE UP	ABS	1	
2	DB61-10145A	CASE LOW	ABS	1	
3	DB64-20054A	DOOR REMOCON	ABS	1	
4	DB63-10477A	COVER BATTERY	ABS	1	
5	DB74-10084A	FILTER REMOCON	PC	1	
6	DB73-20110C	RUBBER REMOCON	SILICON	1	
7	DB64-40167A	INLAY LCD	PC	1	
8	DB64-40166B	INLAY REMOCON	PC	1	
9	DB68-10789B	LABEL REMOCON	ART 90	1	
10	DB68-10790B	LABEL DOOR	ART 90	1	
11	PH-M2	SCREW TAP	PH-M2	6	
12	DB67-60061A	SPRING BATTERY	SUS 304	1	
13	DB67-60062A	SPRING BATTERY	SUS 304	1	
14	DB67-60063A	SPRING BATTERY	SUS 304	1	
15	90 X 250	PE BAG	90 X 250	1	
16	DB93-40179C	ASS'Y PCB REMOCON		1	
17	DB61-40243A	HOLDER REMOCON	ABS	1	

6-3-2 PCB Box



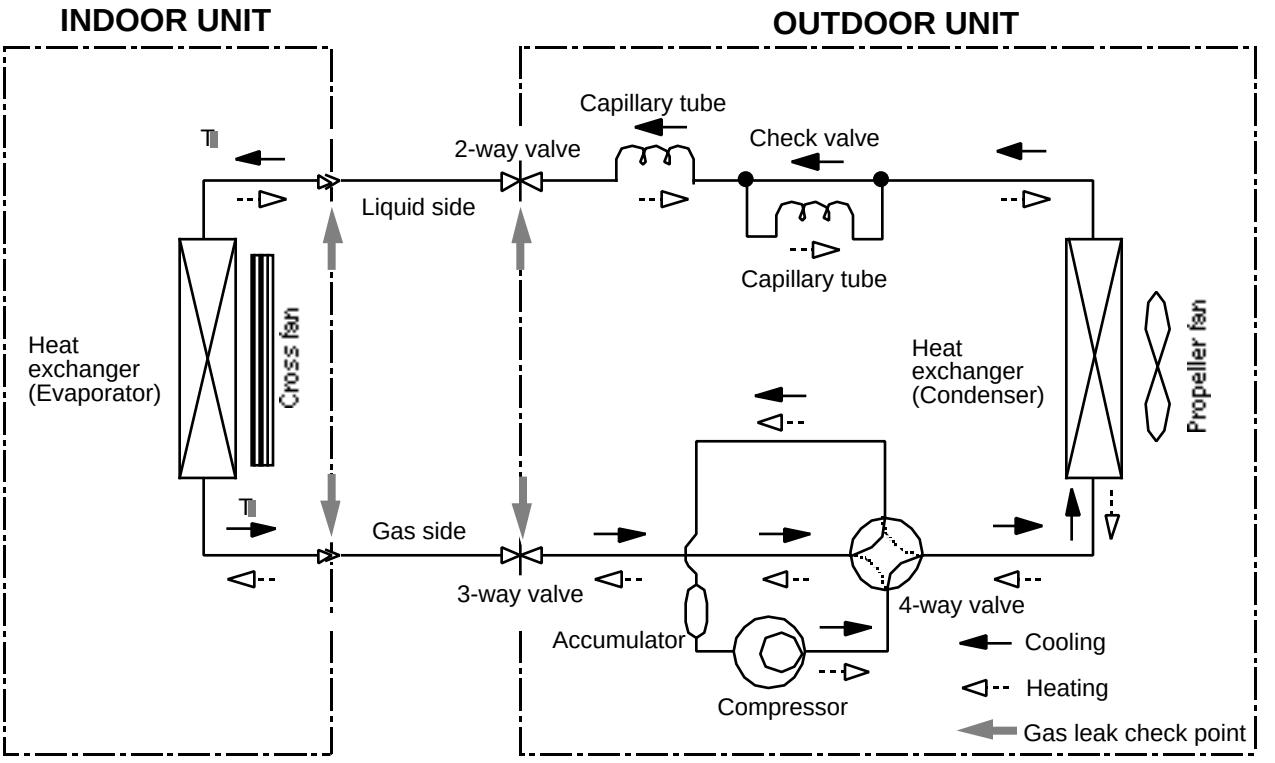
■ Parts List

No	CODE NO	Description	Specification	Q'TY		Remark
				24K BTU	18K BTU	
1	DB61-10151A	CASE-CONTROL	ABS	1	1	
2	DB93-10545B	ASS'Y MAIN PCB	PD-Q24B1Q-03	1(A1,B1)	-	
	DB93-10545D	ASS'Y MAIN PCB	PD-Q24B1Q-06	1(A2,B2)	-	
	DB93-10555E	ASS'Y MAIN PCB	PD-Q24B1Q-09	-	1(A1,B1)	
	DB93-10555F	ASS'Y MAIN PCB	PD-Q24B1Q-11	-	1(A2,B2)	
3	DB32-10008E	ASS'Y THERMISTOR	103AT 240/240	1	1	
4	DB93-10600B	ASS'Y PCB DISPLAY	ROUND	1(B1,B2)	1(B1,B2)	
	DB93-10599B	ASS'Y PCB DISPLAY	EDGE	1(A1,A2)	1(A1,A2)	
5	DB26-10065B	TRANSFORMER	AC230V/DC17	1	1	

MEMO

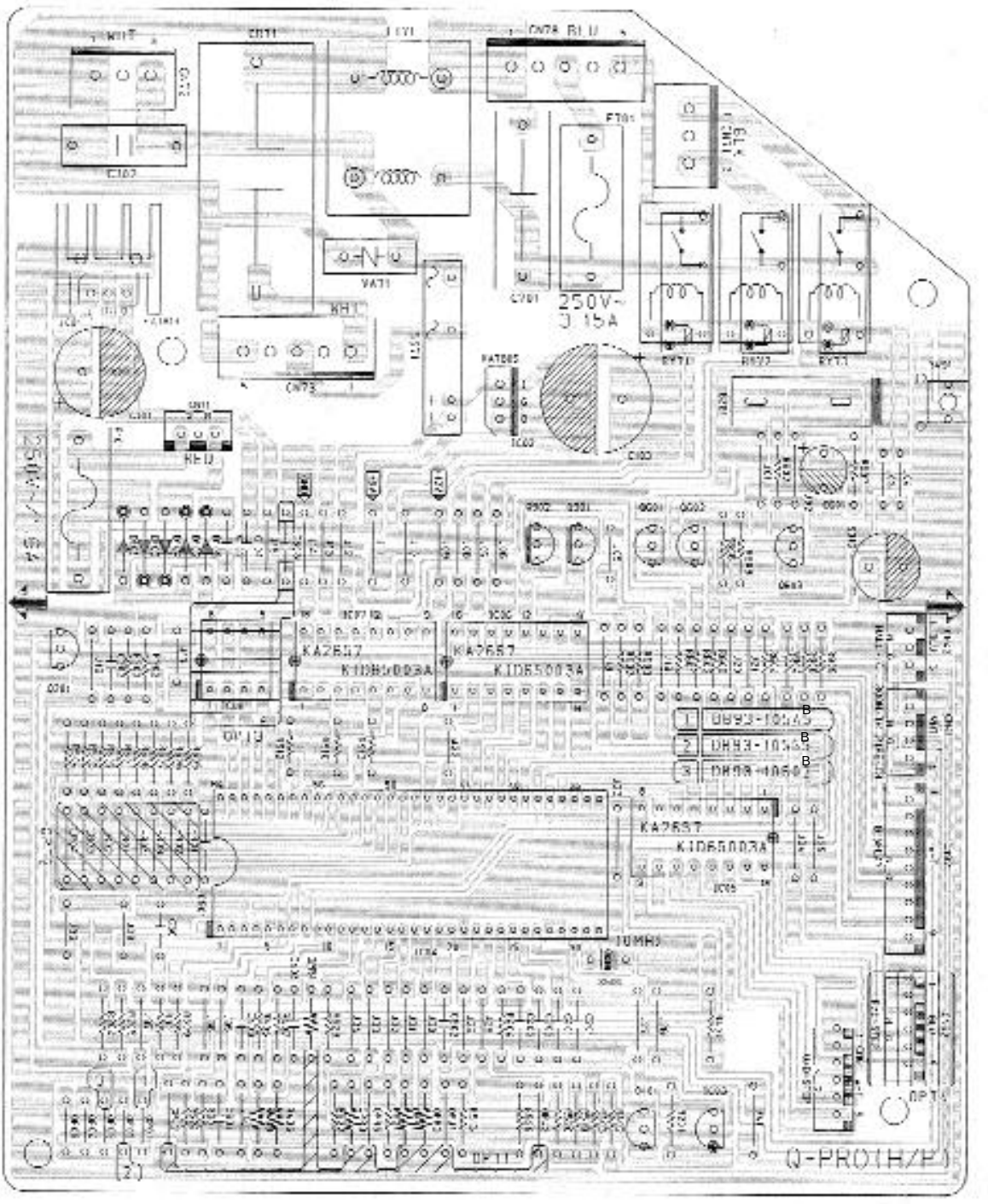
7. Block Diagrams

7-1 Refrigerating Cycle Block Diagram



8. PCB Diagrams

8-1 Main PCB

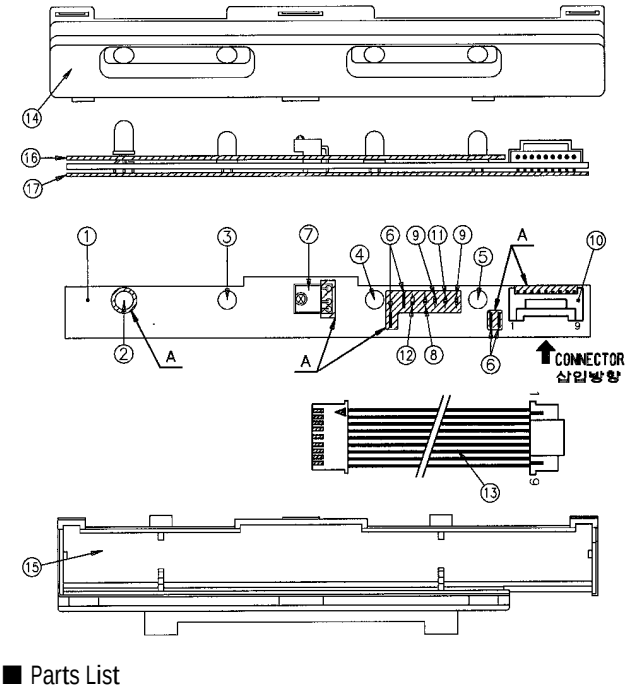


■ Parts List

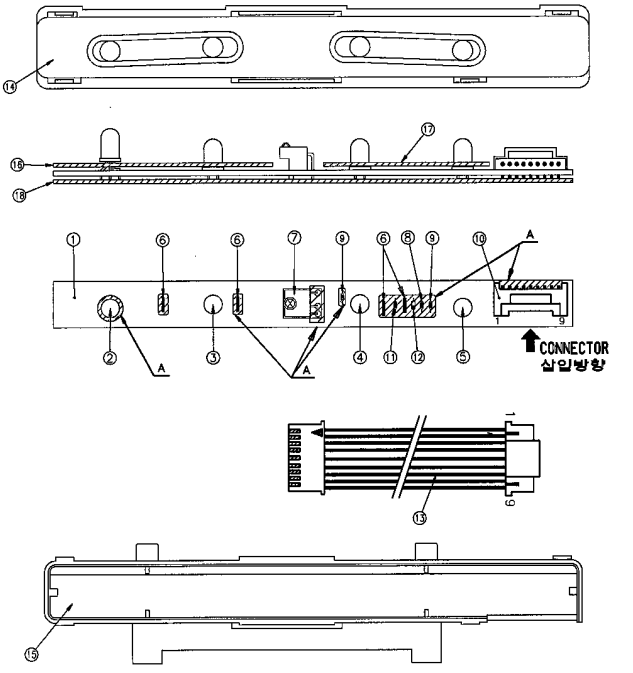
No	DESIGN LOCATION	PART CODE NO	Description	Specification
1	F701	DE32-10037A	FUSE	FST 250V 3.15A
2	F701,F101	DE47-40024A	HOLDER-FUSE	FH-51H 7.5A
3	IC01	DE13-20008A	IC-VOLT REGU	KA7812A
4	IC01	DE62-30032A	HEAT-SINK	AL H25
5	IC01	DE60-10100A	SCREW-PH	M3*6 FeFzY
6	IC02	DE13-10016A	IC-VOLT REGU	KA7805A
7	CR71		C-FILM	CQS 450V 1.2µF
8	FT71		FILTER NOISE	LSAO5230P 250V~2A 23mH*2
9	R903,904,905,906	2001-000776	R-CARBON	RD 1/2 T(S) 621-J
10	R203	2001-000588	R-CARBON	RD 1/4 TP 332-J
11	R202,301,409,501~509,513,519~525,601,604,606,902	2001-000065	R-CARBON	RD 1/4 TP 103-J
12	R405,407	2001-000036	R-CARBON	RD 1/4 TP 331-J
13	R201,204,405,401,402,404,603,606,608	2001-000042	R-CARBON	RD 1/4 TP 102-J
14	R607	2001-000855	R-CARBON	RD 1/4 TP 560-J
15	R602	2001-001088	R-CARBON	RD 1/2 T(S) 102-J
16	R403	2001-000890	R-CARBON	RD 1/4 TP 682-J
17	R910,912,913	A1000-0244	R-CARBON	RD 1/8 TP 332-J
18	R406,408	2004-001137	R-METAL FILM	RD 1/4 TP 682-F
19	D101~105	0402-000137	DIODE-RECT	1N4007
20	SS71	B4190-0016	THYRISTOR	G3MB-202PL
21	BZ61	DE30-20016A	BUZZER	CBE 2220BA STICK
22	C202,402	2202-000783	C-CERAMIC	CA OA 50V 103Z
23	C301,401	2202-000796	C-CERAMIC	CA OA 50V 102Z
24	C102,104,201,203,403,404,501,502,902	2202-000780	C-CERAMIC	CA OA 50V 104Z
25	C103	2401-000710	C-ELEC	CE04 25V 222-M
26	C105	2401-001397	C-ELEC	CE 04 25V 471-M
27	C101	2401-000180	C-ELEC	CE 04 35V 102-M
28	C601	2401-001573	C-ELEC	47/50V
29	IC04	DE09-10149A	IC-MCU	MB89635R-466
30	IC03	DE13-20009A	IC	KA7533Z
31	X501	2802-000103	RSONATOR-CERAMIC	10MHz
32	IC05,IC06,IC07	DE13-20024A	IC-DRIVE	KID65003AP
33	Q201,401,601,602	A4050-0168	TR-GENERAL	KSC945Y
34	Q603	0501-000292	TRANSISTOR	A708Y
35	Q902, Q901	0504-000144	TRANSISTOR	R2002
36	SW91	3404-001013	SWITCH-TACT	KPT-1115V
37	CN73	3711-000262	CONNECTOR WAFER	YW396-05AV WHT
38	CN43	3711-000879	CONNECTOR WAFER	SMW250-03 BLU
39	CN41	3711-000940	CONNECTOR WAFER	SMW250-04 WHT
40	CN61	3711-001038	CONNECTOR WAFER	SMW250-06 WHT
41	CN62	3711-001036	CONNECTOR WAFER	SMW250-06 BLUE
42	CN71		CONNECTOR WAFER	YW396-03AV BLK
43	CN92	3711-001154	CONNECTOR WAFER	SMW250-09 WHT
44	RY72,RY72,RY71	B3068-0092	RELAY	JQ1a-12V
45	J1~J35, HR01~HR04, LR01~LR04, OPJ1, OPJ2, OPJ3	DE39-60001A	WIRE SO COPER	PI0.6 SN T 52MM
46	CN72		CONNECTOR WAFER	YW396-03AV WHT
47	CN11		”	SMW250-03 RED
48	F101	DB47-90053A	FUSE	FST 250V~2A
49	IC08		EEORIM	93C5L
50	R903		R-CARBON	RD 1/2T(S) 471-J
51	C701	2305-001027	C-FILM, MPEF	224K
52	C702		”	104K

8-2 ASS'Y DISPLAY & Module

• Round / Semi-Round / Lip-Type (DB93-10600B)



• Edge Type (DB93-10599B)

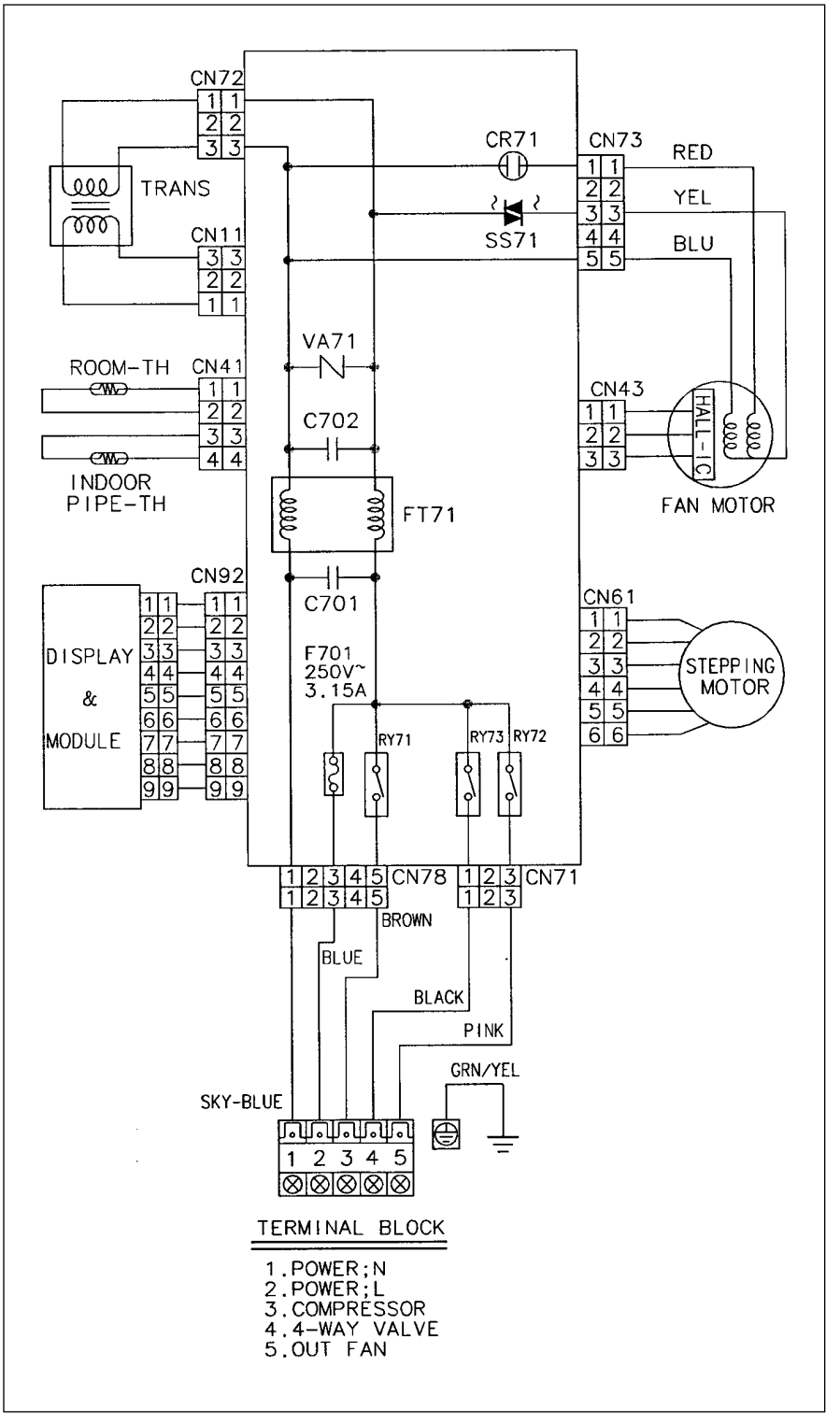


■ Parts List

TYPE	NO	CODE-NO	Description	Specification	Q'TY
	1	DB41-10207B	PCB-DISPLAY	FR-1 T1.6 W16.5 L142.5	1
	2	0601-001333	LED - LAMP	LTL-30EHJ(ORG/GRN)	1
	3	0601-001059	LED - LAMP	SY5511(YEL)	1
	4	0601-001060	LED - LAMP	SM5511(GRN)	1
	5	0601-001196	LED - LAMP	SO5511(ORG)	1
"Round"	6		JUMP WIRE	6mm	4
	7	DB32-50027A	MODULE REMOCON	PNA4612MOOXD	1
"Semi-Round"	8	2202-000780	C-CERAMIC	CA OA 50V 104Z	1
	9	2001-000515	R-CARBON	RD 1/8TP 221-J	2
"Lip"	10		CONNECTOR-WAFER	YWLA200-09P	1
	11	2201-000283	C-CERAMIC	CA OA 50V 102Z	1
Type	12	0401-000005	DIODE SWITCHING	IN4148	1
	13	DB39-20520A	C/W DIS & MODULE	UL1007 AWG#26/9	1
(DB93-10600B)	14	DB61-10194A	(R) CASE-CENTER PCB UP	PC(BLU)	1
	15	DB61-10195A	(R) CASE-CENTER PCB LOW	ABS(BLK)	1
	16	DB72-10238A	SEAL C/T PCB UP	30FOAM-PE, T=3	1
	17	DB72-10239A	SEAL C/T PCB LOW	30FOAM-PE, T=3	1
			A	DCR200H(BROWN)	
	1	DB41-10206B	PCB-DISPLAY	FR-1 T1.6 W13 L141	1
	2	0601-001333	LED - LAMP	LTL-30EHJ(ORG/GRN)	1
	3	0601-001059	LED - LAMP	SY5511(YEL)	1
	4	0601-001060	LED - LAMP	SM5511(GRN)	1
	5	0601-001196	LED - LAMP	SO5511(ORG)	1
	6		JUMP WIRE	6mm	3
"Edge"	7	DB32-50027A	MODULE REMOCON	PNA4612MOOXD	1
	8	2202-000780	C-CERAMIC	CA OA 50V 104Z	1
	9	2001-000515	R-CARBON	RD 1/8TP 221-J	1
Type	10		CONNECTOR-WAFER	YWLA200-09P	1
	11	2201-000283	C-CERAMIC	CA OA 50V 102Z	1
	12	0401-000005	DIODE SWITCHING	IN4148	1
(DB93-10599B)	13	DB39-20520A	C/W DIS & MODULE	UL1007 AWG#26/9	1
	14	DB61-10192A	(R) CASE-CENTER PCB UP	PC(BLU)	1
	15	DB61-10193A	(R) CASE-CENTER PCB LOW	ABS(BLK)	1
	16	DB72-10240A	SEAL C/T PCB UP (L)	30FOAM-PE, T=3	1
	17	DB72-10240B	SEAL C/T PCB UP (R)	30FOAM-PE, T=3	1
	18	DB72-10239A	SEAL C/T PCB LOW	30FOAM-PE, T=3	1
			A	DCR200H(BROWN)	

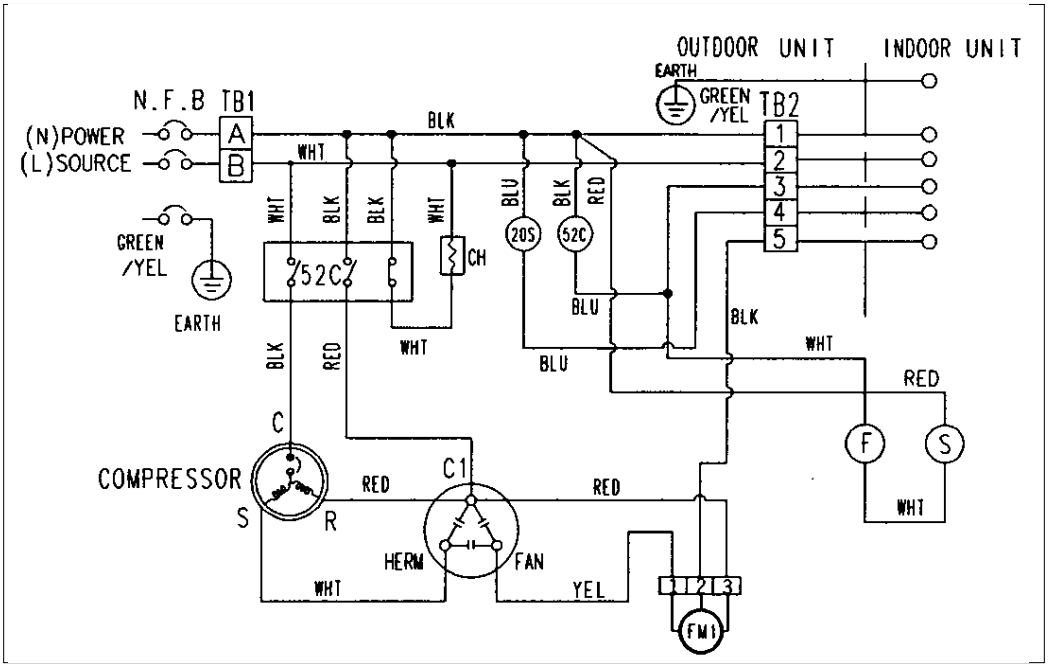
9. Wiring Diagrams

9-1 Indoor Unit

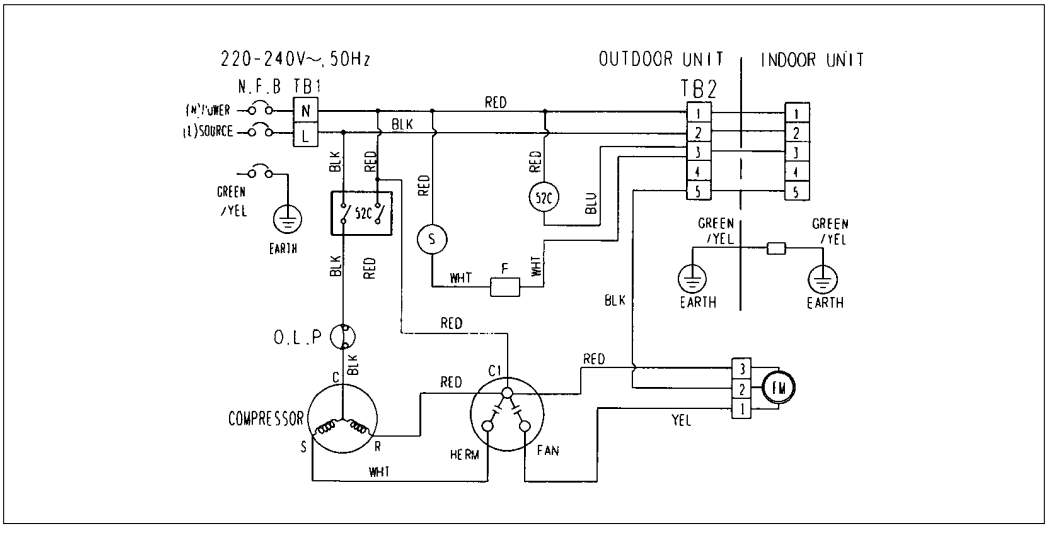


9-2 Outdoor Unit

■ 24K BTU



■ 18K BTU



MARK	NAME	MARK	NAME
52C	MAGNETIC CONTACTOR	TB 1,2	TERMINAL BLOCK
20S	SOLENOID COIL	CH	CRANK CASE HEATER
C1	CAPACITOR	FM1	FAN MOTOR
F	FUSE(2A, 250V~)	S	SPARK KILLER

UPDA TE LOG SHEET

Application date	Page	Part#	Note(Cause & Solution)	S/Bulletin#

Use this page to keep any special servicing information. (Service Bulletin, etc.)
If only parts number changes, Just change parts number directly on parts list.
And if you need more information, please see the service bulletin

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First edition June 1995.

Printed in Korea.

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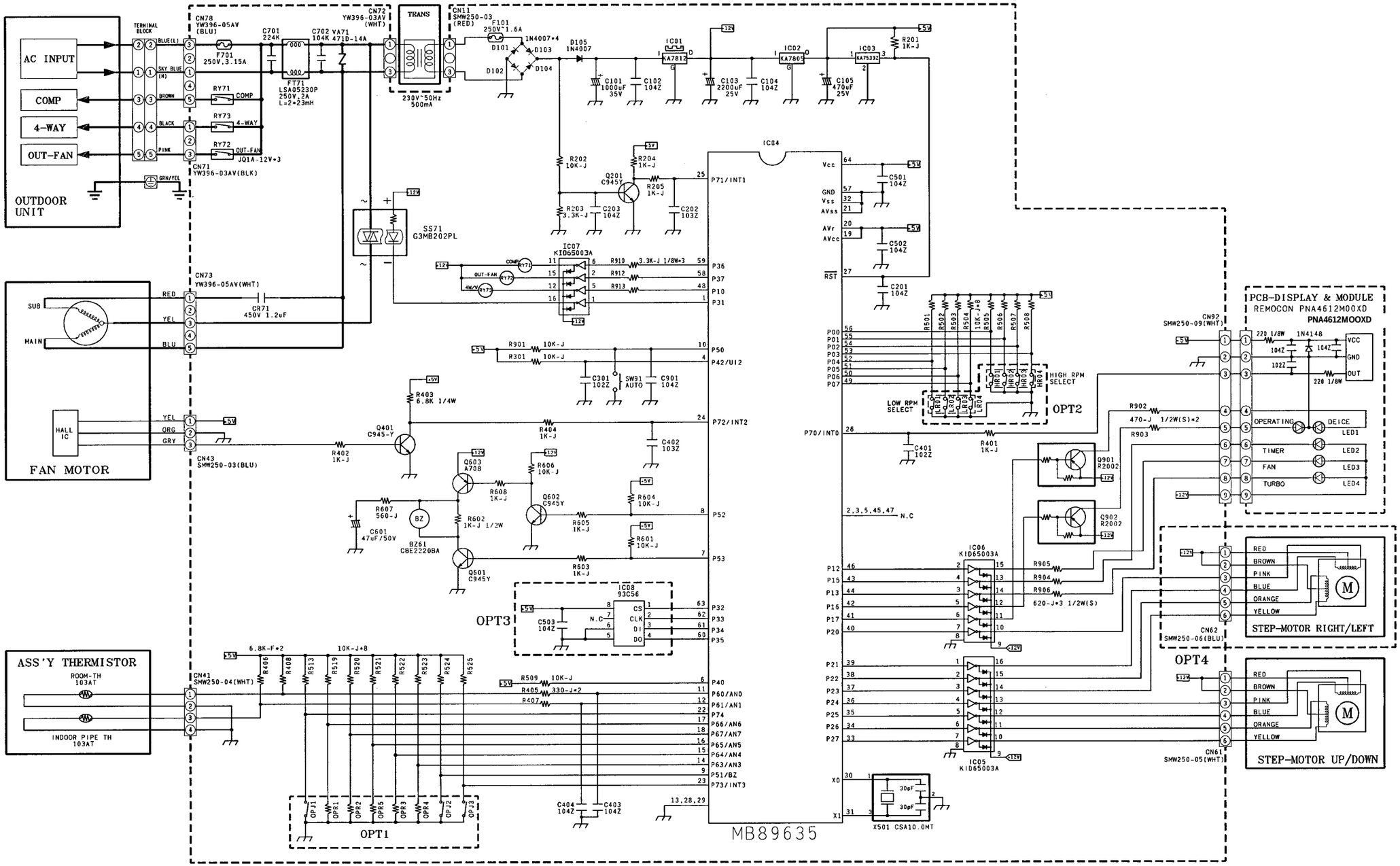
10. Schematic Diagrams

10-1 Indoor Unit